

**California Regional Water Quality Control Board
Santa Ana Region**

September 7, 2007

ITEM: 13

SUBJECT: Public Hearing on the Proposed Basin Plan Amendment to Incorporate Total Maximum Daily Loads (TMDLs) for Organochlorine Compounds for San Diego Creek, Upper Newport Bay and Lower Newport Bay - Supplemental Staff Report

DISCUSSION

On December 1, 2006 and April 20, 2007, public workshops were conducted by the Regional Board to receive evidence and testimony on a proposed Basin Plan amendment to incorporate Total Maximum Daily Loads (TMDLs) for organochlorine compounds (OCs) for San Diego Creek, and Upper and Lower Newport Bay. Board staff also presented a status update regarding the TMDLs during the March 2, 2007 Regional Board meeting. Based on consideration of the comments received, the proposed Basin Plan amendment, which includes the proposed TMDLs for the OCs, targets, wasteload allocations (WLAs), load allocations (LAs), and a plan of implementation, has been revised. This supplemental staff report discusses those revisions.

The comments received during the April 20, 2007 public workshop focused to a large extent on recommendations for changes to or clarification of the tasks identified in the proposed TMDLs Implementation Plan (IP). Other comments questioned the adequacy of Board staff's CEQA analysis of the proposed amendment, particularly in light of a recent court decision (*City of Arcadia v. State Water Resources Control Board* (2006)) that found that the Los Angeles Regional Board had failed to fulfill all applicable CEQA requirements in its adoption of a trash TMDL.

To address these comments, Board staff recommends changes to the proposed implementation plan, as shown in the final draft Basin Plan amendment (Attachment 2 to tentative Resolution No. R8-2007-0024). Attachment A to this staff report shows these and other minor changes to the proposed amendment in strike-out and underline format. The changes are discussed briefly below.

To assure that applicable CEQA requirements are fulfilled, Board staff prepared a Substitute Environmental Document (SED)(July 25, 2007), including an Environmental Checklist, an analysis of reasonably foreseeable methods of

compliance with the proposed TMDL Basin Plan amendment, the evaluation of the potential environmental effects of implementation of these methods and mitigation measures, and an analysis of alternatives. (The Environmental Checklist included in the SED replaces the Checklist included in the November 17, 2006 Organochlorine Compounds TMDLs technical report, which was presented at the December 1, 2006 workshop.) The SED (Attachment B to this staff report) was distributed and made available on the Regional Board website on July 25, 2007.

Requisite notices regarding the Regional Board's hearing and proposed action on this matter have been filed. A Notice of Filing and Public Hearing was circulated 45 days in advance of the September 7, 2007 public hearing.

As discussed in detail in the SED, Board staff found that the implementation of reasonably foreseeable methods of compliance with the organochlorine compounds TMDLs has the potential to result in significant adverse environmental effects with respect to certain Air Quality, Biological Resources, Noise, Transportation/Traffic, and Utilities and Services considerations. While mitigation measures can be employed to substantially lessen the potentially significant impacts identified in the SED, the effects cannot be wholly avoided (i.e., reduced to less than significant levels). However, despite the occurrence of significant unavoidable environmental effects associated with the TMDLs, Board staff believes that there exist certain overriding economic, social, and other considerations for approving the TMDLs that staff believes justify the occurrence of those impacts and render them acceptable. Public Resources Code section 21081(b), and CEQA Guidelines section 15093 require the Regional Board to adopt a "statement of overriding considerations" before approving a project with significant environmental effects, where the Regional Board has concluded that such effects remain significant and unavoidable notwithstanding the incorporation of all mitigation measures and alternatives found to be feasible. In accordance with these requirements, Board staff has prepared the "CEQA Findings of Fact and Statement of Overriding Considerations" for the proposed TMDLs (Attachment 1 to Resolution No. R8-2007-0024). Board staff recommends that the Board adopt these findings and the Statement of Overriding Considerations.

Proposed Revisions to the Recommended TMDL Implementation Plan:

Recommended changes to the proposed implementation plan are as follows:

1. Task 7 of the proposed implementation plan provides the opportunity for interested stakeholders to participate in a Working Group that would be responsible for the development and implementation of a Work Plan. The Work Plan would address implementation of control actions and investigations necessary to comply with the organochlorine compounds TMDLs, and integrate those actions/investigations with the requirements

of other established and pending TMDLs for San Diego Creek and the Newport Bay watershed (e.g., the established Sediment TMDL and the metals and other toxic substance TMDLs). (U.S. EPA has established other toxic substance TMDLs for the Newport Bay watershed; Regional Board staff is working on Basin Plan amendments that would incorporate these TMDLs, with implementation plans, in the Basin Plan.) The language in Tasks 1, 2 and 3 has been revised to clarify the manner in which compliance with the organochlorine compounds TMDLs would be required for Working Group and non-Working Group members. These revisions are shown in underline/strikeout form in Attachment A, Tasks 1-3, pages 18-24. The changes are for clarification purposes only and do not represent substantive modifications of the earlier implementation plan.

2. Task 7 requires the Working Group to consider the other tasks identified in the implementation plan in developing the Work Plan. Stakeholders requested that the specific expectations of this effort be clarified.

In response, the language in Task 7 has been revised to specify: (a) that all the tasks identified in the implementation plan must be considered by the Working Group, except Task 1, which requires action by the Regional Board, and Task 4, which requires action by the Regional Board and the MS4 permittees based on established MS4 permit requirements; and (b) If one or more of the applicable implementation tasks is not proposed for inclusion in the Work Plan, or where modifications of these tasks/schedules are recommended, a written description and justification must be provided with the draft Work Plan submittal.

Note that the Work Plan would be implemented only upon Regional Board approval at a public hearing, providing the opportunity for public input.

These revisions are shown in underline/strikeout form in Attachment A, Task 7, page 30.

3. A number of changes have been included in Task 4 (see Attachment A, pages 24-26):
 - a. References to the Caltrans NPDES permit have been added, since construction BMP requirements apply to Caltrans construction activities. (This reference was also added to Table NB-OCs-14 (page 16 of Attachment A).)
 - b. Certain stakeholders expressed concern about the potential adverse environmental effects of enhanced BMPs and suggested that these potential effects should be considered before their inclusion in the Orange County Stormwater Program Construction Runoff Guidance Manual and/or the Caltrans Storm Water

Management Plan. The language in Task 4 has been revised to provide for this evaluation.

- c. Initially, this task specified that "Upon completion of needed outreach and training concerning the requirements of the SWPPP Improvement Program, applicable SWPPPs that do not adequately address the Program requirements shall be considered inadequate and enforcement shall proceed accordingly" (see Attachment A, page 25, second paragraph). This language has been changed by deleting the reference to outreach and training, since no Regional Board staff resources are available to provide it (changes necessary to reflect this modification are also reflected in Table NB-OCs-13; see page 14 of Attachment A). Further, the language has been revised to reflect that the Regional Board would have enforcement responsibility.
4. For the purposes of clarity, a footnote has been added to Table NB-OCs-13 that specifies that the date for compliance with the TMDLs is no later than December 31, 2015.

Attachments to this supplemental staff report, and to tentative Resolution No. R8-2007-0024 are listed below. Written responses to comments received at least two weeks prior to this public hearing will be prepared (Attachment C to this staff report).

Attachments to September 7, 2007 Supplemental Staff Report

ATTACHMENT		TITLE
Attachment A		Redline Version of Proposed Changes to April 20, 2007 BPA
Attachment B		Substitute Environmental Document
Attachment C		Response to Comments Document
	Attachment C1	Response to Flow Science, Inc. Reports
	Part A - DDT	
	Part B - Chlordane	
	Part C - Toxaphene	
	Attachment C2	Response to Dec 1, 2006 Public Workshop Comments
	Attachment C3	Response to Peer Review Comments
	Attachment C4	Response to State and Federal Agency Comments
	Attachment C5	Response to Local Agencies/Municipalities Comments
	Attachment C6	Responses to Local Stakeholder Groups Comments
	Attachment C7	List of References Cited
Attachment D		Flow Science Reports
	Attachment D1	DDT
	Attachment D2	Chlordane
	Attachment D3	Toxaphene
Attachment E		Responses solicited from outside experts re Drs. Byard and Tjeerdema commentaries
Attachment F		Peer Review Letters
Attachment G		Comment Letters received after Dec 1, 2006 Public Workshop
Attachment H		Comments from Regional Board Workshops
Attachment I		Electronic mail correspondence with Regional Board staff

Attachments to Tentative Resolution No. R8-2007-0024

ATTACHMENT	TITLE
Attachment 1	CEQA Findings of Fact and Statement of Overriding Considerations
Attachment 2	Final Draft San Diego Creek and Upper and Lower Newport Bay Organochlorine Compounds TMDLs Basin Plan amendment

RECOMMENDATION

Regional Board staff recommends that the Regional Board approve Resolution No. R8-2007-0024, adopting (1) the Findings of Fact and Statement of Overriding Considerations shown in Attachment 1 to the Resolution; and, (2) the amendment shown in Attachment 2 to the Resolution to incorporate organochlorine compounds TMDLs and implementation plan for San Diego Creek, Upper and Lower Newport Bay into the Basin Plan.

**California Regional Water Quality Control Board
Santa Ana Region**

RESOLUTION NO. R8-2007- 0024

**Resolution Amending the Water Quality Control Plan for the Santa Ana River
Basin to Incorporate Organochlorine Compounds
Total Maximum Daily Loads (TMDLs) for San Diego Creek,
Upper and Lower Newport Bay, Orange County, California**

WHEREAS, the California Regional Water Quality Control Board, Santa Ana Region (hereinafter, Regional Board), finds that:

1. An updated Water Quality Control Plan for the Santa Ana River Basin (Basin Plan) was adopted by the Santa Ana Regional Water Quality Control Board (Regional Board) on March 11, 1994, approved by the State Water Resources Control Board (SWRCB) on July 21, 1994, and approved by the Office of Administrative Law (OAL) on January 24, 1995.
2. The Basin Plan specifies the following beneficial uses for San Diego Creek, Reach 1: water contact recreation (REC1); non-contact water recreation (REC2); warm freshwater habitat (WARM); and wildlife habitat (WILD).
3. The Basin Plan specifies the following intermittent beneficial uses for San Diego Creek, Reach 2: water contact recreation (REC1); non-contact water recreation (REC2); warm freshwater habitat (WARM); wildlife habitat (WILD); and groundwater recharge (GWR).
4. The Basin Plan specifies the following beneficial uses for Upper Newport Bay: water contact recreation (REC1); non-contact water recreation (REC2); commercial and sportsfishing (COMM); preservation of biological habitats of special significance (BIOL); spawning, reproduction, and development (SPWN); wildlife habitat (WILD); rare, threatened, or endangered species (RARE); marine habitat (MAR); shellfish harvesting (SHEL); and estuarine habitat (EST).
5. The Basin Plan specifies the following beneficial uses for Lower Newport Bay: water contact recreation (REC1); non-contact water recreation (REC2); commercial and sportsfishing (COMM); spawning, reproduction, and development (SPWN); wildlife habitat (WILD); rare, threatened, or endangered species (RARE); marine habitat (MAR); shellfish harvesting (SHEL); and navigation (NAV).
6. The Basin Plan specifies the following narrative water quality objectives pertaining to toxic substances applicable to inland surface waters and enclosed

bays and estuaries: 1) *Toxic substances shall not be discharged at levels that will bioaccumulate in aquatic resources to levels which are harmful to human health; and, 2) The concentrations of toxic pollutants in the water column, sediments or biota shall not adversely affect beneficial uses.*

7. Data from the State Mussel Watch Program, Toxic Substances Monitoring Program, and other water quality monitoring programs provided evidence that one or more of these narrative objectives for toxic pollutants are being or may be violated in San Diego Creek, Upper Newport Bay and Lower Newport Bay. Accordingly, beginning in the 1990's, the Regional Board placed these waterbodies on the Clean Water Act (CWA) §303(d) list of impaired waters, triggering the need for development and implementation of Total Maximum Daily Loads (TMDLs) or other equally effective control actions. The purpose of the TMDLs is to assure that water quality standards are achieved. State law requires that an implementation plan accompany the TMDLs to describe the actions that are to be taken, together with a compliance schedule, if appropriate, to insure that the TMDLs are met and that compliance with water quality standards is achieved.
8. On June 14, 2002, in response to a consent decree, the U.S. Environmental Protection Agency (USEPA) promulgated technical TMDLs for toxic pollutants, including certain organochlorine compounds, in Upper and Lower Newport Bay and San Diego Creek. Consistent with CWA §303(d), USEPA evaluated all readily available data for San Diego Creek and Newport Bay, and used a weight of evidence approach to determine which organochlorine compounds warranted TMDLs. The USEPA technical TMDLs do not include an implementation plan.
9. Subsequent to the USEPA promulgation of technical organochlorine compounds TMDLs for Upper and Lower Newport Bay and San Diego Creek, the State Water Resources Control Board (SWRCB) adopted the "Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List" (State Listing Policy) in September 2004. The State Listing Policy specifies a methodology for placing a water body on the CWA §303(d) list that differs from that used by the USEPA. Regional Board staff conducted an independent impairment assessment, applying the State Listing Policy methodology to relevant data, including data that became available subsequent to USEPA's development of the technical organochlorine compounds TMDLs. Based on that assessment and a separate impairment assessment conducted by State Water Resource Control Board staff, the approved 2004-2006 CWA §303(d) list identifies waterbody-organochlorine compound combinations for San Diego Creek and Upper and Lower Newport Bay that differ from those identified by the USEPA.
10. Pursuant to the revised CWA §303(d) listings and Clean Water Act §303(d)(3), the Regional Board has developed TMDLs for: DDT and toxaphene for San Diego Creek and tributaries; chlordane, DDT, and PCBs for Upper Newport Bay;

and, chlordane, DDT, and PCBs for Lower Newport Bay. In addition, the Regional Board developed informational TMDLs for chlordane and PCBs for San Diego Creek and its tributaries. While impairment due to chlordane and PCBs was not found in San Diego Creek, the informational TMDLs are appropriate because San Diego Creek is the major tributary to Newport Bay. No action to implement the informational TMDLs is required but the informational TMDLs may forward action to address downstream chlordane and PCBs impairments.

11. The TMDL Basin Plan amendment shown in Attachment 2 to this Resolution was developed in accordance with Clean Water Act §303(d) and Water Code Section 13240 *et seq.* The amendment is proposed for incorporation into Chapter 5 "Implementation", of the Basin Plan. The proposed TMDL Basin Plan amendment includes background information concerning the water quality impairment being addressed and the sources of organochlorine compounds to San Diego Creek and Upper and Lower Newport Bay. The proposed TMDLs are supported by a detailed report prepared by Regional Board staff and titled "Total Maximum Daily Loads for Organochlorine Compounds, San Diego Creek: Total DDT and Toxaphene. Upper and Lower Newport Bay: Total DDT, Chlordane, Total PCBs", November 17, 2006 (hereinafter, "TMDL Report"). Revisions to the proposed TMDLs described in the TMDL Report were made in response to comments. These revisions are described in supplemental staff reports dated April 20, 2007 and September 7, 2007.
12. The TMDL Basin Plan amendment will assure the reasonable protection of the beneficial uses of surface waters within the Region and is consistent with the State antidegradation policy (SWRCB Resolution No. 68-16).
13. The adoption and implementation of these TMDLs is necessary to reduce loadings of organochlorine compounds to San Diego Creek and Upper and Lower Newport Bay, and to address water quality impairments that arise therefrom. This action is necessary to assure conformance with state and federal law and regulation, which require that surface water quality standards be achieved and protected.
14. The proposed amendment meets the "Necessity" standard of the Administrative Procedure Act, Government Code, Section 11352(b).
15. The Regional Board submitted the relevant technical documents that serve as the basis for the proposed amendment to an external scientific review panel and has considered the comments and recommendations of that panel in drafting the amendment.
16. The proposed amendment will result in revisions to the Basin Plan Chapter 5 "Implementation".

17. The Regional Board discussed this matter at workshops conducted on December 1, 2006 and April 20, 2007 after notice was given to all interested persons in accordance with Section 13244 of the California Water Code. Based on the discussion at those workshops, the Board directed staff to prepare the appropriate Basin Plan amendment and related documentation to incorporate the San Diego Creek and Upper and Lower Newport Bay organochlorine compounds TMDLs.
18. The Regional Board prepared and distributed written reports (staff reports) regarding adoption of the Basin Plan amendment in accordance with applicable state and federal environmental regulations (California Code of Regulations, Section 3775, Title 23, and 40 CFR Parts 25 and 131).
19. The Regional Board has considered the costs associated with implementation of this amendment, as well as the costs resulting from failure to implement organochlorine compound control measures necessary to prevent adverse effects on beneficial uses. The implementation plan in the Basin Plan, which includes extended compliance schedules and employs a phased TMDL approach to provide for refinement based on additional studies and analyses, will ensure that implementation expenditures are reasonable and fairly apportioned among dischargers.
20. The process of basin planning has been certified by the Secretary for Resources as exempt from the requirement of the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000 et seq.) to prepare an Environmental Impact Report (EIR) or Negative Declaration (ND). In lieu of an EIR or ND, the Regional Board must comply with applicable regulations on exempt regulatory programs. These regulations require the preparation of a substitute environmental document (SED) to take the place of an EIR or ND. Consistent with this requirement, the Regional Board prepared an SED dated July 25, 2007. The Regional Board distributed the SED for public review in compliance with CEQA. Along with the SED, the Regional Board circulated the TMDL Report and supplemental staff reports. The SED complies with applicable CEQA requirements to describe the proposed project, assess the potential adverse environmental effects of implementation of reasonably foreseeable methods of compliance, identify mitigation measures and evaluate alternatives.
21. The Substitute Environmental Document (SED) comprises a First Tier environmental document as called for by Public Resources Code section 21159 and the California Code of Regulations, Title 14, section 15187. When and if specific projects are proposed to achieve compliance with the requirements of the organochlorine compounds TMDLs shown in Attachment 2 to this Resolution, these projects shall be reviewed, as required in conformance with applicable CEQA regulations, on a project-specific basis.

22. As described in the SED, the implementation of reasonably foreseeable methods of compliance with the organochlorine compounds TMDLs has the potential to result in significant adverse environmental effects with respect to certain Air Quality, Biological Resources, Noise, Transportation/Traffic, and Utilities and Services considerations. While mitigation measures can be employed to substantially lessen the potentially significant impacts identified in the SED, the effects cannot be wholly avoided (i.e., reduced to less than significant levels).
23. Measures that are available to mitigate the potential adverse environmental effects identified in the SED can and should be required by local, regional, state and federal lead and responsible agencies through their CEQA/NEPA, planning, project approval, CWA Sec. 401 certification and/or permitting (where necessary) processes. The Regional Board will identify appropriate mitigation measures in response to site-specific CEQA analysis of projects proposed to implement the TMDLs. Appropriate mitigation requirements will be incorporated in discharge requirements issued to regulate specific implementation projects and/or in Clean Water Act Section 401 water quality certifications. Mitigation monitoring will also be required to judge the efficacy of the measures and need for improvement. Discharge requirements, 401 certifications, or other regulatory actions of the Regional Board as necessary, will require improvements to the mitigation measures and/or the implementation of these measures if and as the need is demonstrated by applicable monitoring requirements.
24. Attachment 1 to this Resolution is the "CEQA Findings of Fact and Statement of Overriding Considerations for the Organochlorine Compounds Total Maximum Daily Loads for San Diego Creek, Upper Newport Bay and Lower Newport Bay Substitute Environmental Document" (hereafter "Findings") prepared in order to satisfy the requirements of Public Resources Code section 21081.
25. As the proposed Findings demonstrate, all of the potentially significant environmental effects associated with the TMDLs can either be substantially lessened or avoided by the mitigation measures proposed in the SED.
26. As the proposed Findings also demonstrate, most of the potentially significant environmental effects of the TMDLs can be fully avoided (i.e., rendered less than significant) by the adoption of feasible mitigation measures or by mitigation measures that can and should be implemented by other agencies.
27. As the proposed Findings also demonstrate, the mitigation measures that can and should be implemented by other agencies address impacts outside the regulatory jurisdiction of the Regional Board under the Water Code.
28. Those potentially significant effects that have not been fully avoided can be substantially lessened by the adoption of feasible mitigation measures, although those effects still remain significant and unavoidable.

29. The Regional Board has determined, pursuant to Public Resources Code section 21081(a)(3), that certain mitigation measures or alternatives proposed in the SED are infeasible within the meaning of CEQA.
30. Because the Regional Board will incorporate in discharge requirements, 401 certifications and other regulatory actions as necessary mitigation requirements sufficient to at least substantially lessen all significant environmental effects, the Board is not required to assess whether any of the alternatives in the SED are environmentally superior with respect to the significant effects of the Project, or whether any environmentally superior alternative is feasible within the meaning of CEQA.
31. The Regional Board has nevertheless chosen to include within the Findings a discussion as to whether any of the alternatives discussed in the SED are both feasible and environmentally superior to the TMDLs as proposed with respect to the significant unavoidable effects of the TMDLs.
32. Public Resources Code section 21081(b), and CEQA Guidelines section 15093 require the Regional Board to adopt a "statement of overriding considerations" before approving a project with significant environmental effects, where the Regional Board has concluded that such effects remain significant and unavoidable notwithstanding the incorporation of all mitigation measures and alternatives found to be feasible.
33. The Regional Board desires, in accordance with CEQA, to declare that, despite the occurrence of significant unavoidable environmental effects associated with the TMDLs, there exist certain overriding economic, social, and other considerations for approving the TMDLs that the Regional Board believes justify the occurrence of those impacts and render them acceptable.
34. Attachment 1 to this Resolution includes a statement of overriding considerations specifying the economic, social, and other benefits that render acceptable the significant unavoidable environmental effects associated with the TMDLs.
35. The Regional Board recognizes its obligation, pursuant to Public Resources Code section 21081.6(a), to ensure the monitoring of those feasible mitigation measures outlined in the proposed Findings.
36. The TMDLs contain monitoring provisions prepared in order to comply with Water Code section 13242(c). Monitoring requirements will be incorporated in discharge requirements, Clean Water Act Section 401 certifications and other necessary regulatory actions taken by the Regional Board to assure that the mitigation requirements are effective.

37. Water Code Section 13421 requires a Regional Board, in establishing water quality objectives, to consider the costs of compliance. (*City of Arcadia v. State Water Resources Control Board* (2006) 135 Cal.App.4th 1392, 1415.) Where, as here, the Regional Board is considering TMDLs that will implement an existing water quality objective rather than establishing a new one, Water Code Section 13241 does not apply. The Regional Board has nevertheless considered the costs of compliance with the TMDL. That analysis, presented in Section 9 of the November 17, 2006 Staff Report for the TMDL and in the SED, fully satisfies any obligation to address Water Code Section 13241.
38. The Basin Plan amendment must be submitted for review and approval by the State Water Resources Control Board (SWRCB), Office of Administrative Law (OAL) and U.S. Environmental Protection Agency (USEPA). Once approved by the SWRCB, the amendment is submitted to OAL and USEPA. The Basin Plan amendment will become effective upon approval by OAL. A Notice of Decision will be filed.
39. The Notice of Filing, Notice of Public Hearing, the TMDL Report, Substitute Environmental Document, and the draft amendment were prepared and distributed to interested individuals and public agencies for review and comment, in accordance with state and federal regulations (23 CCR 3775, 40 CFR 25 and 40 CFR 131).
40. For the purposes of specifying compliance schedules in NPDES permits for effluent limitations necessary to implement these TMDLs, the schedules specified in these TMDLs shall govern, notwithstanding other compliance schedule authorization language in the Basin Plan.
41. On September 7, 2007, the Regional Board held a public hearing to consider the Basin Plan amendment. The Notice of Public Hearing was distributed on July 25, 2007 to all interested persons and published in accordance with Water Code Section 13244.
42. At the public hearing, the Regional Board received comments from interested stakeholders, government agencies, and the public. The Regional Board has considered those comments.
43. The Regional Board chooses to exercise its discretion to approve the TMDLs as modified through the adoption of feasible mitigation measures and through the findings that other mitigation measures can and should be implemented by other agencies.

NOW, THEREFORE BE IT RESOLVED THAT:

1. In approving this Resolution, the Board adopts the Findings, as set forth in Attachment 1, in order to satisfy its obligations under Public Resources Code sections 21002 and 21081 and CEQA Guidelines sections 15091 and 15093.
2. The Regional Board adopts the amendment to the Water Quality Control Plan for the Santa Ana River Basin (Region 8), as set forth in Attachment 2.
3. The Executive Officer is directed to forward copies of the Basin Plan amendment to the SWRCB in accordance with the requirements of Section §13245 of the California Water Code.
4. The Regional Board requests that the SWRCB approve the Basin Plan amendment, in accordance with Sections §13245 and §13246 of the California Water Code, and forward it to the OAL and U.S. EPA for approval.
5. If, during its approval process, Regional Board staff, SWRCB or OAL determines that minor, nonsubstantive corrections to the language of the amendment are needed for clarity or consistency, the Executive Officer may make such changes, and shall inform the Board of any such changes.
6. The Executive Officer is directed, at the time of filing and posting the Notice of Decision, to take steps to promptly ensure payment of \$850 to the Department of Fish and Game for its review of the SED or to file a Certificate of Fee Exemption, whichever is appropriate.

I, Gerard J. Thibeault, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of a resolution adopted by the California Regional Water Quality Control Board, Santa Ana Region, on September 7, 2007.

Gerard J. Thibeault
Executive Officer

**CEQA FINDINGS OF FACT
AND
STATEMENT OF OVERRIDING CONSIDERATIONS**

**For the Organochlorine Compounds Total Maximum Daily Loads
for San Diego Creek, Upper Newport Bay and Lower Newport
Bay
Substitute Environmental Document**

September 7, 2007

I. Introduction

A Substitute Environmental Document (SED) (July 25, 2007) was prepared by Santa Ana Regional Water Board staff to evaluate the potential adverse environmental effects of the reasonably foreseeable methods of compliance with Regional Board staff's recommended organochlorine compounds Total Maximum Daily Loads (TMDLs) for San Diego Creek, Upper Newport Bay and Lower Newport Bay. This SED describes and was prepared in conformance with applicable requirements for compliance with the California Environmental Quality Act (CEQA) (Public Resources Code, Sec. 21000 *et seq.*) and the CEQA Guidelines (California Code of Regulations, tit. 14, Sec. 15000 *et seq.*) These findings have been prepared also to comply with the requirements of CEQA.

II. Project Description

The project entails the adoption of a Basin Plan amendment to incorporate organochlorine compounds TMDLs for San Diego Creek, Upper Newport Bay and Lower Newport Bay and the implementation of these TMDLs. The amendment includes the implementation plan.

Based on findings of impairment of water quality standards due to certain organochlorine compounds in San Diego Creek (DDT and toxaphene), Upper Newport Bay (DDT, chlordane, PCBs) and Lower Newport Bay (DDT, chlordane and PCBs), these waterbody-pollutant combinations are included on the state and USEPA-approved 2004-2006 Clean Water Act Section 303(d) list for California. Per the Clean Water Act and implementing regulations, placement on the 303(d) list triggers the development and implementation of TMDLs to correct the impairment.

Based on earlier 303(d) listings, in 2002, USEPA established toxic substance TMDLs for San Diego Creek, Upper Newport Bay and Lower Newport Bay. USEPA's TMDLs included the organochlorine compounds identified above, as well as certain other organochlorine compounds. The organochlorine compound TMDLs recommended by Regional Board staff would supplant those established by the USEPA upon their approval by the state and USEPA.¹

¹ As a matter of information, in the absence of adoption and approval of the Regional Board's TMDLs, the Board must implement the organochlorine compounds TMDLs established by USEPA. The USEPA TMDLs do not include an implementation plan. Accordingly, the Regional Board would employ best professional judgment to determine the requirements, including permit limitations, to be specified for responsible parties to implement the USEPA TMDLs. In determining the appropriate requirements, the Regional Board must assure that other relevant regulations, for example, the established Sediment TMDL for the Newport Bay/San Diego Creek watershed, are implemented as well.

As noted above, the TMDLs recommended by Regional Board staff include an implementation plan that identifies specific actions to be taken by the Regional Board and dischargers of covered pollutants in the watershed. The implementation plan also establishes compliance schedules for the completion of the specified actions and for ultimate compliance with the TMDLs.

The purpose of a TMDL, including the organochlorine compounds TMDLs, is to achieve requisite reduction of the inputs of the pollutant(s) causing impairment such that water quality standards are achieved. Water quality standards include beneficial uses and narrative and numeric water quality objectives. It is required by law and in the public interest to implement the organochlorine compounds TMDLs to assure that uses of the affected waterbodies for aquatic and terrestrial wildlife, including species that are or may be listed by state and/or federal agencies as endangered or threatened, are protected. Implementation of the TMDLs is also necessary to assure the protection of the health of human consumers of fish and other organisms that may contain one or more of the organochlorine compounds addressed by the recommended TMDLs.

The technical basis for and derivation of the proposed TMDLs and their individual components, including the numeric targets, wasteload allocations and load allocations, are described in detail in the November 17, 2006 TMDL technical report prepared by Regional Board staff and in supplemental staff reports (April 20, 2007, September 7, 2007). The implementation plan for the TMDLs is also described in these reports.

III. Background

A detailed discussion of the environmental and regulatory setting for the organochlorine compounds TMDLs is provided in Section 3 of the July 25, 2007 Substitute Environmental Document.

IV. Findings Required Under CEQA

Public Resources Code section 21002 provides that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available that would *substantially lessen* the significant environmental effects of such projects. (Emphasis added.) The same statute states that the procedures required by CEQA are intended to assist public agencies in systematically identifying both the significant effects of projects and the feasible alternatives or feasible mitigation measures that will *avoid* or *substantially lessen* such significant effects. (Emphasis added.) Public Resources Code section 21002 further states in the event that specific economic, social, or other conditions make infeasible such project alternatives or such

mitigation measures, individual projects may be approved in spite of one or more significant effects. In this case, for each significant environmental effect identified in the environmental document (here, the SED, which includes an environmental checklist) for a proposed project, the approving agency must issue a written finding reaching one or more of three permissible conclusions. The first such finding is that changes or alterations have been required in, or incorporated into, the project that avoid or substantially lessen the significant environmental effect as identified in the environmental document. (CEQA Guidelines,² Sec. 15091(a)(1)). The second permissible finding is that such changes or alterations are within the responsibility and jurisdiction of another public agency and not the agency making the finding. Such changes have been adopted by such other agency or can and should be adopted by such other agency. (CEQA Guidelines, Sec. 15091(a)(2).) The third potential conclusion is that specific economic, legal, social, technological, or other considerations make infeasible the mitigation measures or project alternatives identified in the environmental document (CEQA Guidelines, Sec. 15091(a)(3).) Public Resources Code section 21061.1 defines "feasible" to mean capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, social and technological factors. CEQA Guidelines section 15364 adds another factor: legal considerations. (See also *Citizens of Goleta Valley v. Board of Supervisors* (*Goleta II*) (1990) 52 Cal.3d 553, 565.) The concept of feasibility also encompasses the question of whether a particular alternative or mitigation measure promotes the underlying goals and objectives of a project. (*City of Del Mar v. City of San Diego* (1982) 133 Cal.App.3d 410, 417.)

The CEQA Guidelines do not define the difference between avoiding a significant environmental effect and merely substantially lessening such an effect. The meaning of these terms must be gleaned from the other contexts in which the terms are used. Public Resources Code section 21081, on which CEQA Guidelines section 15091 is based, uses the term "mitigate" rather than "substantially lessen." The CEQA Guidelines therefore equate mitigating with substantially lessening. Such an understanding of the statutory term is consistent with the policies underlying CEQA, which include the policy that public agencies should not approve projects as proposed if there are feasible alternatives or feasible mitigation measures available that would substantially lessen the significant environmental effects of such projects. (Pub. Resources Code, sec. 21002.)

For purposes of these findings, the term "avoid" refers to the effectiveness of one or more mitigation measures to reduce an otherwise significant effect to a less than significant level. In contrast, the term "substantially lessen" refers to the effectiveness of such measure or measures to substantially reduce the severity of a significant effect, but not to reduce that effect to a less than significant level.

² The CEQA Guidelines are found at Title 14, California Code of Regulations, Section 15000 et seq.

These interpretations appear to be mandated by the holding in *Laurel Hills Homeowners Association v. City Council* (1978) 83 Cal.App.3d 515, 519-527, in which the Court of Appeal held that an agency had satisfied its obligation to substantially lessen or avoid significant effects by adopting numerous mitigation measures, not all of which rendered the significant impacts in question (e.g., the aesthetic and visual character) less than significant.

In short, CEQA requires that the lead agency adopt mitigation measures or alternatives, where feasible, to substantially lessen or avoid significant environmental impacts that would otherwise occur. Project modification or alternatives are not required, however, where such changes are infeasible or where the responsibility for modifying the project lies with some other agency. (CEQA Guidelines, Sec. 15091(a), (b).)

Although CEQA Guidelines section 15091 requires only that approving agencies specify that a particular significant effect is avoided *or* substantially lessened, these findings, for purposes of clarity, in each case will specify whether the effect in question has been reduced to a less than significant level, or has simply been substantially lessened but remains significant.

V. Significant Effects and Mitigation Measures

The Substitute Environmental Document (SED) identifies environmental impacts according to their characterization in the environmental checklist: (1) potentially significant; (2) less than significant with mitigation incorporation; (3) less than significant; and (4) no impact.

Potentially significant impacts. These are impacts that are potentially significant, but not completely mitigable. While, as described in the discussion of each of these impacts in the SED, mitigation measures can be employed to substantially lessen these effects, the effects cannot be wholly avoided (i.e., reduced to less than significant levels). These impacts are also known as “significant and unavoidable” impacts. These effects are outweighed by overriding considerations in favor of the project as set forth in Section VII, below.

Less than significant with mitigation incorporation. These are potentially significant impacts that can be reduced to less than significant as the result of the incorporation of mitigation measures. Again, these mitigation measures are described in the SED.

Less than significant impacts and those described as “no impact” are not required to be included in the Findings per the CEQA Guidelines.

This Section presents the Regional Board's findings with respect to the environmental effects identified as (1) potentially significant and (2) less than significant with mitigation incorporation. Applicable references to the checklist and description of mitigation measures in the SED are provided. Both this document and the SED are integral components of these findings of fact.

Checklist: I. Aesthetics

Impacts on Aesthetics will be significant if they result in any of the following:

- a) Have a substantial adverse effect on a scenic vista;
- b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;
- c) Substantially degrade the existing visual character or quality of the site and its surroundings;
- d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area.

Project Impacts: Less than significant with mitigation incorporation (a, b, c and d)

Mitigation: Discussion of the aesthetic impacts of reasonably foreseeable methods of TMDL compliance and mitigation measures is provided on pages 24-27 of the SED. Planning, design, and siting of structural BMPs implemented to comply with the TMDLs, the use of vegetative or other buffers, proper timing of construction and operation of structural BMPs, shielding of light fixtures and low-intensity, directional lighting and rotational timing of light fixtures can and should reduce these impacts to less than significant levels.

Finding: Mitigation measures are available to reduce aesthetics impacts to less than significant. These mitigation measures can and should be required by local lead and responsible agencies through their project-specific CEQA, planning, project approval and/or project permitting processes.

Checklist II. Agriculture Resources

Impacts on Agriculture Resources will be significant if they result in any of the following:

- a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use;
- b) Conflict with existing zoning for agricultural use, or a Williamson Act contract;

- c) Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland, to non-agricultural use.

Project Impacts: No impact (a, b and c).

Mitigation: None necessary. See SED, pages 27 and 28.

Finding: Under CEQA, no mitigation measures are required for impacts that are less than significant, or where there is no impact. (Pub. Resources Code, Sec. 21002; CEQA Guidelines, Sec. 15091.)

Checklist: III. Air Quality

Impacts on Air Quality will be significant if they result in any of the following:

- a) Conflict with or obstruct implementation of the applicable air quality plan;
- b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- d) Expose sensitive receptors to substantial pollutant concentrations;
- e) Create objectionable odors affecting a substantial number of people.

Project Impacts: Potentially significant (a, b, c and d); Less than significant with mitigation incorporation (e).

Mitigation: Discussion of the air quality impacts of the reasonably foreseeable methods of compliance with these TMDLs and mitigation measures is provided on pages 28-31 of the SED. Use of the following can and should reduce the impacts identified in a through d, but these impacts may remain significant: low-emission vehicles/equipment, soot reduction traps/diesel particulate filters, emulsified diesel fuel; vacuum-assisted street sweepers; design of BMPs to minimize the need for maintenance; proper vehicle maintenance; use of moisture control measures to reduce fugitive dust. Use of these measures, coupled with design and operation measures intended to prevent stagnation of any standing water and devices to reduce odors (e.g., filters, aeration devices, odor-suppressing chemical additives) can and should reduce the odor-related impacts (e) to less than significant.

Finding: While mitigation measures can be employed to substantially lessen the effects identified in a, b, c and d, the effects cannot be wholly avoided (i.e., reduced to less than significant levels). However, these effects are outweighed by overriding considerations (see Section VII). Mitigation measures are available

to reduce impacts resulting from objectionable odors that affect a substantial number of people (e) impacts to less than significant. These mitigation measures can and should be required by local lead and responsible agencies through their project-specific CEQA, planning, project approval and/or permitting processes.

Checklist: IV. Biological Resources

Impacts on Biological Resources will be significant if they result in any of the following:

- a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service;
- b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service;
- c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means;
- d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites;
- e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance;
- f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan.

Project Impacts: Potentially significant (a); Less than significant with mitigation incorporation (b, c, d and f). (No impact (e)).

Mitigation: The biological resources impacts of reasonably foreseeable methods of compliance with the TMDLs and mitigation measures are discussed on pages 31-35 of the SED. Each project that may be considered by responsible dischargers to comply with the TMDLs will be subject to detailed, project-specific CEQA and, where required, National Environmental Policy Act (NEPA) review by responsible agencies, including the Regional Board, Department of Fish and Game and the U.S. Fish and Wildlife Service. Prior consultation with the Department of Fish and Game and the U.S. Fish and Wildlife Service, through the pre-project planning and/or CEQA-NEPA processes, and implementation of avoidance/mitigation measures imposed by those agencies, will reduce the effects of TMDL control measures on special status species. However, the

finding of potential significance is required when special status species may be affected. Proper planning, design and implementation of methods of compliance, in coordination with the Department of Fish and Game, U.S. Fish and Wildlife Service and Regional Board (in response to CEQA, Clean Water Act (CWA) Section 401 water quality certification/waste discharge requirements) and with established conservation plans, will assure that the potential effects identified in b, c, d and f are reduced to less than significant levels.

Finding: Mitigation measures are available to reduce the effects on special status species (a) identified by the Department of Fish and Game and the U.S. Fish and Wildlife Service through pre-project planning and/or CEQA-NEPA processes. To the extent that the methods of TMDL compliance employed necessitate CWA Sec. 401 certification and issuance of waste discharge requirements, the Regional Board shall incorporate appropriate avoidance and mitigation requirements based on consultation with the Department of Fish and Game and U.S. Fish and Wildlife Service. The Regional Board will also serve as a responsible agency for project-specific CEQA analyses and identify measures necessary to mitigate the water quality standards impacts of proposed compliance projects, including impacts on special status species and other biological resources. To the extent that any impacts remain significant even with mitigation, these impacts are outweighed by overriding considerations (see Section VII). Mitigation measures can and should also be required by the Department of Fish and Game and U.S. Fish and Wildlife Service for impacts on special status species.

Similarly, the biological resource effects identified in b, c, d and f can be mitigated to less than significant levels. Appropriate mitigation requirements will be specified in CWA 401 certifications and waste discharge requirements issued by the Regional Board as necessary and appropriate to regulate the implementation of control measures. Appropriate mitigation measures will also be identified by the Regional Board in project-specific CEQA reviews to address potential water quality standards impacts, including impacts on biological resources. The Department of Fish and Game and U.S. Fish and Wildlife Service can and should also require the implementation of appropriate avoidance and mitigation methods through their permitting, consultation and CEQA-NEPA processes. Local agencies with relevant plans, policies or ordinances can and should assure that the methods of compliance conform to those plans, policies and ordinances and require appropriate avoidance and mitigation, where necessary. These actions can and should be taken through the local agencies through their project-specific CEQA, planning, project approval and/or permitting processes.

For checklist item (e), the project will have no impact. Under CEQA, no mitigation measures are required for impacts that are less than significant, or

where there is no impact. (Pub. Resources Code, Sec. 21002; CEQA Guidelines, Sec. 15091.)

Checklist V. Cultural Resources

Impacts on cultural resources will be significant if they result in any of the following:

- a) Cause a substantial adverse change in the significance of a historical resource as defined in CCR Tit. 14 15064.5;
- b) Cause a substantial adverse change in the significant of an archaeological resource pursuant to CCR Tit. 14 15064.5;
- c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature;
- d) Disturb any human remains, including those interred outside of formal cemeteries.

Project Impacts: Less than significant with mitigation incorporation (a, b, c and d)

Mitigation: The cultural resource impacts of reasonably foreseeable methods of compliance with the TMDLs and mitigation are discussed on pages 35 and 36 of the SED. Proper planning, site-design and site selection can reduce these effects to less than significant levels.

Finding: Mitigation measures are available to reduce cultural resources impacts to less than significant. Local agencies can and should require site-relocation and/or alternative project design/implementation to mitigate these potential impacts. These actions can be taken through the local agencies' project-specific CEQA, planning, project approval and/or permitting processes.

Checklist VI. Geology and Soils

Impacts on geology and soils will be significant if they result in any of the following:

- a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:
 - i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.
 - ii) Strong seismic ground shaking
 - iii) Seismic-related ground failure, including liquefaction
 - iv) Landslides

- b) Result in substantial soil erosion or the loss of topsoil;
- c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on-site or off-site landslide, lateral spreading, subsidence, liquefaction or collapse;
- d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property;
- e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

Project Impacts: Less than significant with mitigation incorporation (b, c and d)
(No impact: a and e).

Mitigation: The geology and soils impacts of reasonably foreseeable methods of compliance with the TMDLs and mitigation are discussed on pages 36-38 of the SED. Local and state requirements for sediment control measures for construction activities are in place as the result of NPDES permits issued by the State Water Board/Regional Water Board (general construction permit/MS4 permit). Proper siting (to ensure that structural BMPs are not employed in areas subject to unstable soil conditions), engineering design and operation of control measures, coupled with pre-project geotechnical investigations and groundwater level monitoring where necessary to determine site suitability, can reduce these impacts to less than significant levels.

For checklist items (a) and (e), the project will have no impact. Under CEQA, no mitigation measures are required for impacts that are less than significant, or where there is no impact. (Pub. Resources Code, Sec. 21002; CEQA Guidelines, Sec. 15091.)

Finding: Mitigation measures are available to reduce geology and soils impacts to less than significant. Local agencies can and should require proper evaluation of control measure site location and design and implementation of alternatives as necessary as part of their project-specific CEQA, planning, project approval and/or permitting processes. Local agencies and the Regional Board shall adopt new requirements, revise existing requirements as necessary and enforce existing and new/revised requirements for the implementation of effective erosion and sedimentation control measures.

Checklist: VII. Hazards and Hazardous Materials

Impacts related to hazards and hazardous materials will be significant if they result in any of the following:

- a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;

- b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;
- c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school;
- d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment;
- e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area;
- f) For a project within the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area;
- g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan;
- h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands.

Project Impacts: Less than significant with mitigation incorporation (a, e, f and g); (Less than significant (b and h); No impact c and d).

Mitigation: The hazards and hazardous materials-related impacts of the reasonably foreseeable methods of compliance with the TMDLs and mitigation are described on pages 38-42 of the SED. These impacts can be reduced to less than significant levels by one or more of the following: proper handling, storage and disposal procedures for hazardous materials; pre-project site characterization and consideration of project alternatives, including alternative sites and project designs that would avoid or minimize the exposure of hazardous materials; provision of specific materials/equipment storage and parking areas; use of temporary streets to reduce traffic obstruction; proper timing of transport of oversize trucks and equipment.

Finding: Mitigation measures are available to reduce impacts related to hazards and hazardous materials to less than significant levels. These mitigation measures can and should be required by local lead and responsible agencies through their project-specific CEQA, planning, project approval and/or permitting processes. The Regional Board will also identify appropriate mitigation measures to protect water quality standards through project-specific CEQA reviews.

For checklist items (b), (c), (d), and h, the project will have a less than significant impact or no impact. Under CEQA, no mitigation measures are required for impacts that are less than significant, or where there is no impact. (Pub. Resources Code, Sec. 21002; CEQA Guidelines, Sec. 15091.)

Checklist: VIII. Hydrology and Water Quality

Hydrology and water quality Impacts will be significant if they result in any of the following:

- a) Violate any water quality standards or waste discharge requirements;
- b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted);
- c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on-site or off-site;
- d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-site or off-site;
- e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff;
- f) Otherwise substantially degrade water quality;
- g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map;
- h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows;
- i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam;
- j) Inundation by seiche, tsunami, or mudflow.

Project Impacts: Less than significant with mitigation incorporation (a,c,d,f,i,j);
Less than significant (b); No impact (e,g,h).

Mitigation: The hydrology and water quality impacts of the reasonably foreseeable methods of compliance with the TMDLs and mitigation are described on pages 42-46 of the SED. These impacts can be reduced to less than significant with the implementation of one or more of the following: standard BMPs (e.g., silt fences, installation of small-scale retention basins, construction of swales, proper use of chemical flocculating agents such as polyacrylamide monomer (PAM) to hold sediment in place; proper siting, design and operation of structural BMPs; adequate consideration of potential seismic effects in planning, design and construction of large-scale structural BMPs.

Finding: Mitigation measures are available to reduce hydrology and water quality impacts to less than significant levels. These mitigation measures can and should be required by local lead and responsible agencies through their project-specific CEQA, planning, project approval and/or permitting processes. The Regional Board shall adopt conditions in CWA Sec. 401 certifications (where applicable), issue new waste discharge requirements, revise existing waste discharge requirements as necessary and enforce existing/new/revised requirements to assure the implementation of effective erosion and sedimentation control measures and compliance with 401 certification conditions/waste discharge requirements. The Regional Board will also identify appropriate mitigation measures as needed through the project-specific CEQA review process.

For checklist items (b), (e), (g) and (h) the project will have a less than significant impact or no impact. Under CEQA, no mitigation measures are required for impacts that are less than significant, or where there is no impact. (Pub. Resources Code, Sec. 21002; CEQA Guidelines, Sec. 15091.)

Checklist: IX. Land Use and Planning

Impacts on land use and planning will be significant if they result in any of the following:

- a) Physically divide an established community;
- b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect;
- c) Conflict with any applicable habitat conservation plan or natural community conservation plan.

Project Impacts: No impact (a); Less than significant (b and c)

Mitigation: None necessary. See SED, pages 46 and 47.

Finding: Under CEQA, no mitigation measures are required for impacts that are less than significant, or where there is no impact. (Pub. Resources Code, Sec. 21002; CEQA Guidelines, Sec. 15091)

Checklist: X. Mineral Resources

The impacts on mineral resources will be significant if they result in any of the following:

- a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state;

- b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan.

Project Impacts: Less than significant with mitigation incorporation (a and b)

Mitigation: The mineral resources impacts of the reasonably foreseeable methods of compliance with the TMDLs and mitigation are described on pages 47 and 48 of the SED. Impacts to mineral resources can be avoided or reduced by proper planning, site design and consideration/selection of alternative locations.

Finding: Mitigation measures are available to reduce mineral resource impacts to less than significant levels. These mitigation measures can and should be required by local lead and responsible agencies through their CEQA, planning, project approval and/or permitting processes.

Checklist: XI. Noise

Noise impacts will be significant if they result in any one of the following:

- a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project;
- d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, exposure of people residing or working in the project area to excessive noise levels;
- f) For a project within the vicinity of a private airstrip, exposure of people residing or working in the project area to excessive noise levels.

Project Impacts: Potentially significant (a, b, d, e and f). No impact (c).

Mitigation: The noise impacts of the reasonably foreseeable methods of compliance with the TMDLs and mitigation are discussed on pages 48-50 of the SED. Noise impacts can be reduced but not completely avoided by preparation and implementation of site-specific operational plans that specify measures to limit noise impacts, including: project timing to minimize public exposure, the use of sound barriers such as walls or vegetation, and proper operation and

maintenance of vehicles and equipment fitted with mufflers; proper operation and maintenance of equipment; timing of equipment transport to minimize public exposure to noise/groundborne vibration.

Finding: While mitigation measures can be employed to substantially lessen the noise impacts identified in a, b, d, e and f, the effects cannot be wholly avoided (i.e., reduced to less than significant levels). However, these effects are outweighed by overriding considerations (see Section VII). The available mitigation measures can and should be required by local lead and responsible agencies through their CEQA, planning, project approval and/or permitting processes.

For checklist item (c) the project will have no impact. Under CEQA, no mitigation measures are required for impacts that are less than significant, or where there is no impact. (Pub. Resources Code, Sec. 21002; CEQA Guidelines, Sec. 15091.)

Checklist: XII. Population and Housing

Population and housing impacts will be significant if they result in any of the following:

- a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure);
- b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere;
- c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.

Project Impacts: No impact (a, b, and c).

Mitigation: None necessary. See SED, pages 50-51.

Finding: Under CEQA, no mitigation measures are required for impacts that are less than significant, or where there is no impact. (Pub. Resources Code, Sec. 21002; CEQA Guidelines, Sec. 15091).

Checklist: XIII. Public Services

Public services impacts will be significant if they result in any of the following:

- a) Substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant

environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Fire protection

Police protection

Schools

Parks

Other public facilities

Project Impacts: No impact.

Mitigation: None necessary. See SED, page 51-52.

Finding: Under CEQA, no mitigation measures are required for impacts that are less than significant, or where there is no impact. (Pub. Resources Code, Sec. 21002; CEQA Guidelines, Sec. 15091).

Checklist: XIV. Recreation

The recreation impacts will be significant if they result in any of the following:

- a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated;
- b) Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.

Project impacts: Less than significant (a); No impact (b).

Mitigation: None necessary. See SED, pages 52-53.

Finding: Under CEQA, no mitigation measures are required for impacts that are less than significant, or where there is no impact. (Pub. Resources Code, Sec. 21002; CEQA Guidelines, Sec. 15091).

Checklist: XV. Transportation/Traffic

Transportation/traffic impacts will be significant if they result in any of the following:

- a) Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections);

- b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways;
- c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks;
- d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment);
- e) Result in inadequate emergency access;
- f) Result in inadequate parking capacity;
- g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks).

Project Impacts: Potentially significant (a and b); less than significant with mitigation incorporation (d); less than significant (f); no impact (c, e and g).

Mitigation: The transportation/traffic impacts of reasonably foreseeable methods of compliance with the TMDLs and mitigation are discussed on pages 53-55 of the SED. Transportation/traffic impacts can be reduced but, in the case of (a) and (b), not completely avoided by: changing the timing of vehicle/equipment movement to avoid high traffic periods; proper design and construction of structural BMPs to avoid substantial increased roadway hazards; proper siting and design of BMPs, including additional/alternative parking.

Finding: While mitigation measures can be employed to substantially lessen the transportation/traffic impacts identified in a and b, the effects cannot be wholly avoided (i.e., reduced to less than significant levels). However, these effects are outweighed by overriding considerations (see Section VII). For checklist item (d), mitigation measures are available to reduce transportation/traffic impacts to less than significant levels. The available mitigation measures can and should be required by local lead and responsible agencies through their CEQA, planning, project approval and/or permitting processes.

For checklist items (c), (e), (f) and (g) the project will have a less than significant impact or no impact. Under CEQA, no mitigation measures are required for impacts that are less than significant, or where there is no impact. (Pub. Resources Code, Sec. 21002; CEQA Guidelines, Sec. 15091.)

Checklist: XVI. Utilities and Service Systems

The utilities and service systems impacts will be significant if they result in any of the following:

- a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board;

- b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed;
- e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments;
- f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs;
- g) Comply with federal, state, and local statutes and regulations related to solid waste.

Project Impacts: Potentially significant (c and f); Less than significant (a); No impact (b, d, e, and g).

Mitigation: The utilities and service systems impacts of reasonably foreseeable methods of compliance with the TMDLs and mitigation are discussed on pages 55-58 of the SED. Utilities and service systems impacts can be reduced but, in the case of (c) and (f), not completely avoided by: proper siting, design, construction and operation of BMPs; implementation of mitigation measures identified in the previous discussions of air quality, transportation/traffic and noise effects (measures may reduce impacts associated with BMP implementation (c), but it is unlikely that these impacts could be completely avoided; see discussions above); use of pre-project planning to anticipate land disposal needs and to assess the need for implementation of project alternatives; use of alternative BMPs, where necessary.

Finding: While mitigation measures can be employed to substantially lessen the utilities and service systems impacts identified in c and f, the effects cannot be wholly avoided (i.e., reduced to less than significant levels). However, these effects are outweighed by overriding considerations (see Section VII). The available mitigation measures can and should be required by local lead and responsible agencies through their CEQA, planning, project approval and/or permitting processes.

For checklist items (a), (b), (d), (e) and (g) the project will have a less than significant impact or no impact. Under CEQA, no mitigation measures are required for impacts that are less than significant, or where there is no impact. (Pub. Resources Code, Sec. 21002; CEQA Guidelines, Sec. 15091.)

Checklist: XVII. Mandatory Findings of Significance

The impacts of the project will be significant if they result in any of the following:

- a) The project has the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory;
- b) The project has impacts that are individually limited, but cumulatively considerable. ('Cumulatively considerable' means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.);
- c) The project has environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly.

Project Impacts: Potentially significant (a); less than significant with mitigation incorporation (b). (Less than significant (c)).

Mitigation: (a) The implementation of reasonably foreseeable methods of compliance with the proposed TMDLs could result in potentially significant environmental impacts with respect to certain Air Quality, Biological Resources, Noise, Transportation/Traffic, and Utilities and Services considerations. These impacts and mitigation measures are described in the SED on pages 28-31, 31-35, 48-50, 53-55 and 55-58, respectively. Mitigation measures are also summarized in the preceding discussion of these impacts in this Findings of Fact/Statement of Overriding Considerations document. (b) The implementation of reasonably foreseeable methods of compliance with the proposed TMDLs could result in cumulative impacts that are less than significant with mitigation incorporation (SED, p. 59).

Finding: While mitigation measures can be employed to substantially lessen the potentially significant impacts identified above, the effects cannot be wholly avoided (i.e., reduced to less than significant levels). However, these effects are outweighed by overriding considerations (see Section VII). The available mitigation measures can and should be required by local, regional, state and federal lead and responsible agencies through their CEQA/NEPA, planning, project approval, CWA Sec. 401 certification and/or permitting processes.

For checklist item (c) the project will have a less than significant impact. Under CEQA, no mitigation measures are required for impacts that are less than significant, or where there is no impact. (Pub. Resources Code, Sec. 21002; CEQA Guidelines, Sec. 15091.)

VI. Alternatives Analysis and Findings

Where the Regional Board has determined that, even after the adoption of all feasible mitigation measures, the implementation of the proposed organochlorine compounds TMDLs will still cause one or more significant environmental effects that cannot be substantially lessened or avoided, the Regional Board, prior to approving the TMDLs, must first determine whether, with respect to such impacts, there remain any project alternatives that are both environmentally superior and feasible within the meaning of CEQA. An alternative may be "infeasible" if it fails to fully promote the Regional Board's underlying goals and objectives with respect to the TMDLs, or if the alternative does not comply with applicable law or regulation.

As described in Section V of this document and the SED for the TMDLs, most of the significant environmental effects of the reasonably foreseeable methods of compliance with the TMDLs can be lessened to less than significant levels through the imposition of mitigation requirements by local, regional, state or federal agencies. However, in certain cases, the environmental effects remain potentially significant. The following are the potentially significant impacts of the implementation of reasonably foreseeable methods of compliance with the organochlorine compounds TMDLs:

Checklist: III. Air Quality, a, b, c and d, as shown below.

- a) Conflict with or obstruct implementation of the applicable air quality plan;
- b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors);
- d) Expose sensitive receptors to substantial pollutant concentrations;

Checklist: IV. Biological Resources a. Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.

(Note: as described in the SED, page 31-33 and Section V. Significant Effects and Mitigation Measures, Checklist IV. Biological Resources, page 7-8, above, mitigation measures are available to substantially lessen the impacts of reasonably foreseeable methods of compliance on special status species.

However, the potential for adverse impacts on these species necessitates a finding of potentially significant impact.)

Checklist: XI. Noise, a, b, d, e and f, as shown below.

- a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies;
- b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels;
- d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project;
- e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, the project would expose people residing or working in the project area to excessive noise levels;
- f) For a project within the vicinity of a private airstrip, the project would expose people residing or working in the project area to excessive noise levels.

Checklist: XV. Transportation/Traffic, a and b, as shown below.

- a) Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections);
- b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways.

Checklist: XVI. Utilities and Service Systems c and f, as shown below.

- c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects;
- g) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs.

The Regional Board considered a number of alternatives to the recommended TMDLs to determine whether: (1) an environmentally superior alternative is available; and, (2) whether an environmentally superior alternative, if available, would meet the objective of the TMDLs to achieve water quality standards; and, (3) whether an environmentally superior alternative that meets the TMDL objective would be legally feasible. A detailed analysis of alternatives to the

proposed TMDLs is provided in the SED on pages 62-71. Based on that analysis, the Regional Board concludes that:

- A. The No Project Alternative (i.e., the Regional Board would not adopt and implement the recommended TMDLs; see SED, section 7.1) is not environmentally superior. In the absence of Regional Board adopted TMDLs that are approved by the state (State Board and the Office of Administrative Law) and the U.S. EPA, the Regional Board is required to implement the organochlorine compounds TMDLs already established by the U.S. EPA (see SED, Sec. 3.2 Regulatory Setting). The implementation of the U.S. EPA TMDLs would have environmental effects comparable to those of the Regional Board staff recommended TMDLs. The No Project Alternative may result in greater environmental effects since there would be no allowance for a compliance schedule to implement the U.S. EPA's TMDLs, nor would there be the explicit opportunity for the coordinated and comprehensive approach to resolve water quality standards concerns affecting Newport Bay and its tributaries that is afforded by the implementation plan recommended by Regional Board staff.
- B. The alternative to adopt a Basin Plan amendment to incorporate the U.S. EPA organochlorine compounds TMDLs unchanged and to add a plan to implement those TMDLs is not legally feasible (and, in any case, is not environmentally superior). (See SED, section 7.2.) The U.S. EPA organochlorine compounds TMDLs do not implement established regulations for Newport Bay and its watershed, as expressed in the Sediment TMDL for these waters. The Sediment TMDL is incorporated in the Basin Plan and must be implemented.
- C. Use of alternative guidelines for evaluating water quality standards impairment (SED, section 7.3.1) could result in recommendations for delisting from the CWA Sec. 303(d) list one or more of the organochlorine compounds for which TMDLs are now recommended by Regional Board staff. TMDLs would not be required for the delisted compound(s), thereby eliminating the potential environmental effects resulting from implementation of TMDLs for these substances. However, an approved delisting is necessary to obviate the need for some or all of the TMDLs; use of alternative evaluation guidelines in the impairment assessment alone would not suffice to reduce or eliminate the potential environmental effects of the recommended TMDLs. The waterbody-pollutant combinations for which Regional Board staff recommends TMDLs are included in the 2004-2006 CWA Sec. 303(d) list; TMDLs for these waterbody-pollutant combinations are now legally required.

Use of alternative impairment evaluation guidelines suggested by certain stakeholders during the development of the recommended organochlorine compounds TMDLs is not legally feasible since the suggested guidelines

have not been subject to scientific peer review and thus do not comport with the State Board's Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (September 2004)(Listing Policy). In any case, application of alternative evaluation guidelines alone would not be sufficient to effect changes in the set of TMDLs required pursuant to federal law and regulation, as described in the preceding paragraph.

- D. Use of alternative numeric targets to develop the TMDLs (SED, section 7.3.2) could result in less stringent TMDLs, requiring reduced implementation of control measures to achieve the TMDLs. Therefore, less stringent numeric targets may be associated with reduced potential environmental effects. The targets used by Regional Board staff as the basis for development of the recommended TMDLs are scientifically defensible, have been peer reviewed (consistent with the State Listing Policy), and will assure that the objective of the TMDLs to achieve water quality standards will be met. Alternative numeric targets recommended by certain stakeholders were rejected because they have not been peer reviewed and/or do not assure that the objective of the TMDLs will be met. TMDLs based on the stakeholders' recommended alternative numeric targets would therefore not likely be approved by the U.S. EPA.³ Absent the adoption of recommended TMDLs by the state and their approval by the U.S. EPA, the Regional Board would be required to implement the established U.S. EPA TMDLs. The relative environmental effect of this alternative is discussed in "A", above.
- E. A variety of permutations and combinations of tasks and schedules necessary to implement the TMDLs was considered, including: (1) withholding action on the TMDLs pending resolution of technical uncertainties; (2) specifying a longer compliance schedule in the implementation plan; (3) specifying a shorter (or no) compliance schedule in the implementation plan.

Withholding action to adopt the recommended TMDLs would require the Regional Board to implement the established U.S. EPA TMDLs. The environmental effect of this alternative is comparable to or greater than that of the recommended TMDLs (see discussion in "A", above).

Specifying a longer compliance schedule may allow resolution of technical uncertainties that might affect the stringency of and even need for TMDLs.

³ Cognizant of existing controversy regarding the appropriate numeric targets and the recommendations of certain stakeholders for alternative targets, USEPA staff (Cindy Lin) commented on Regional Board staff's proposed TMDLs and, specifically, the numeric targets, at the December 1, 2006 workshop. Ms. Lin stated that the proposed TMDLs "include the best available science, and that the numeric targets "are appropriate numeric values...they should achieve the TMDL goals". Separate discussions between Ms. Lin and Regional Board staff during the development of the proposed TMDLs confirmed USEPA's discomfort with the alternative target recommendations, since the alternatives recommended had not been subject to peer review and would not assure the protection of beneficial uses.

Less stringent TMDLs, or elimination of certain TMDLs, would likely result in reduced environmental effects since BMP implementation requirements would be reduced or eliminated. However, TMDLs with an extended compliance schedule are not likely to be approved by the U.S. EPA⁴. In that case, the Regional Board would be required to implement the established U.S. EPA TMDLs. The environmental effect of this alternative is comparable to or greater than that of the recommended TMDLs (see discussion in "A", above).

The potential environmental effects of an immediate compliance schedule or a schedule shorter than that proposed would likely be more severe, given that there would not be an allowance of time to consider appropriate control actions and to integrate them with control actions necessary to achieve other TMDLs and waste discharge requirements. The implementation plan recommended by Regional Board staff allows for integration of control measures to address multiple sources of impairment. This should reduce the overall environmental impact of multiple control measures implemented individually, and should provide more effective, timely and resource-efficient control of water quality standards impairment in the watershed.

The schedules identified in the recommended implementation plan provide a reasonable period for responsible parties to implement the tasks identified in the implementation plan, and to identify the need for modification of the TMDLs (and/or implementation plan). The recommended implementation plan allows stakeholders, including the Regional Board to address water quality standards problems in a coordinated and comprehensive manner that is expected to be more effective, timely, and resource-efficient. Further, the comprehensive and coordinated approach should reduce the cumulative environmental effects of independent implementation of control measures to meet separate permit and/or other TMDL requirements. The recommended implementation plan also provides stakeholder flexibility in identifying and implementing control measures that minimize environmental impacts and/or in providing requisite mitigation on a case-specific basis.

- F. No environmentally superior, legally feasible alternative that meets the objective of the TMDLs to achieve water quality standards (as required by the Clean Water Act and implementing regulations) has been identified. The recommended TMDLs take a phased approach specifically intended to allow for further investigation, resolution of technical uncertainties and future refinement of the TMDLs as warranted. The effect of this approach, coupled with coordinated implementation of other TMDL/permit requirements, should

⁴ USEPA staff (Cindy Lin) expressed concern with a compliance schedule that extends beyond that proposed in the TMDLs (December 31, 2015) in a telephone conversation with Regional Board staff on July 3, 2007.

be to minimize potentially significant adverse environmental impacts of the implementation of the TMDLs.

VII. Statement of Overriding Considerations

The potentially significant environmental impacts of the recommended organochlorine compounds TMDLs are listed in Section VI, above. Findings and mitigation measures that would lessen these environmental impacts, though likely not to levels of insignificance, are presented in Section V, above. These impacts/mitigation measures are also described in detail in the July 25, 2007 SED, Sections 5 and 6. The project benefits outweigh these environmental effects as follows:

- A. Per the California Water Code, the recommended TMDLs include an implementation plan that specifies the actions that must be taken to achieve the TMDLs, with appropriate compliance schedules. Absent the recommended TMDLs and implementation plan, the Regional Board is required to implement the organochlorine compounds TMDLs established by the U.S. EPA in 2002, which do not include an implementation plan or compliance schedules. Since no schedules are specified in the U.S. EPA TMDLs, Regional Board permits issued to implement those TMDLs cannot legally provide compliance schedules: immediate compliance must be required. Implementation of the recommended TMDLs, relying on the accompanying implementation plan, rather than the U.S. EPA TMDLs, has the significant benefit of avoiding or reducing the following adverse effects:
 - a. Regional Board requirements for immediate compliance pursuant to the U.S. EPA TMDLs would likely necessitate permit enforcement orders (e.g., cease and desist orders), which would take additional Regional Board staff resources to develop, justify and enforce. To the extent that Regional Board resources must be diverted in this manner, action on other pressing water quality issues would be delayed.
 - b. Implementation of the U.S. EPA TMDLs without a defined and approved implementation plan would require application of Best Professional Judgment by the Regional Board to identify permit terms and conditions that implement the TMDLs, as well as other established and relevant regulations, e.g., the Sediment TMDL for the Newport Bay/San Diego Creek watershed. Application of Best Professional Judgment, rather than reliance on a well-defined and approved implementation plan, would likely result in increased time and effort in preparing and defending recommended permit limitations. This could have the effect of delaying needed actions to implement the TMDLs, and could divert the Regional Board and

Regional Board staff from work necessary to address other pressing water quality issues.

- B. Implementation of the Board staff-recommended TMDLs, relying on the accompanying implementation plan, rather than the U.S. EPA TMDLs, also has the following significant benefit. The Board staff recommended TMDLs will be implemented in a phased manner, with a compliance schedule that provides time for control actions to be deployed and for review and revision of the TMDLs, if found necessary. Future refinement of the TMDLs may lead to a revised implementation plan that obviates the need for one or more control actions, with resultant reductions in potential adverse environmental effects and resource expenditures by the responsible dischargers. The Board staff recommended implementation plan also allows the watershed stakeholders to implement a coordinated and comprehensive strategy to address the requirements of the recommended TMDLs and other established TMDLs and/or permits. The net effect of the phased, coordinated and comprehensive implementation approach should be a reduction in the potential cumulative environmental effects of the implementation of control measures to respond to TMDLs/permits on an individual basis. Further, this approach should provide a timelier, more effective and more resource-efficient method of achieving and maintaining water quality standards. In contrast, implementation of the U.S. EPA TMDLs, which do not include an implementation plan or compliance schedule, would likely forego opportunities for coordinated and comprehensive control actions. This would result in less efficient and timely correction of existing water quality standards impairments in the subject waterbodies due to multiple pollutants, as well as greater resource expenditures and environmental effects associated with the implementation of control actions intended to address each source of impairment independently.
- C. In the absence of the Board staff-recommended TMDLs (i.e., the No Project Alternative), implementation of the U.S. EPA organochlorine compounds TMDLs would be required. The adverse environmental impacts from the Board staff-recommended would be equivalent to or less severe than the impacts from the U.S. EPA TMDLs.
- D. Assessments conducted by both Regional Board and State Board staff found that use of San Diego Creek and Upper and Lower Newport Bay by aquatic life, wildlife (including birds) and by fishermen is impaired or threatened by one or more organochlorine compounds as the result of bioaccumulation of these substances in animal tissue that may be consumed by wildlife predator species and/or humans. Implementation of the Board staff recommended organochlorine compounds TMDLs will correct this water quality standards impairment of the covered

waterbodies, thereby protecting public health and the biota. Implementation of the U.S. EPA organochlorine compounds TMDLs would likewise correct water quality standards impairment due to organochlorine compounds but would not provide for integrated, and therefore more efficient and timely, control of multiple pollutants causing water quality standards impairment in the waterbodies addressed by the TMDLs, with implementation plan, recommended by Board staff.

ATTACHMENT 2 TO RESOLUTION NO. R8-2007- 0024

(NOTE: The language identified below is proposed to be inserted into Chapter 5 of the Basin Plan. If the amendment is approved, corresponding changes will be made to the Table of Contents, the List of Tables, page numbers, and page headers in the plan. Due to the two-column page layout of the Basin Plan, the location of tables in relation to text may change during final formatting of the amendment. In order to accommodate other new TMDLs adopted as Basin Plan amendments and to maintain their order by watershed, the table and figure identifiers may be modified in future formatting of the Basin Plan for re-publication purposes. However, no substantive changes to the tables/figures would occur absent a Basin Plan Amendment.)

Chapter 5 - Implementation Plan, Discussion of Newport Bay Watershed (page 5-39 et seq), add the following to 4. Toxics Substances Contamination

4.b Organochlorine Compounds TMDLs

Organochlorine compounds, including DDT, PCBs, toxaphene and chlordane, possess unique physical and chemical properties that influence their persistence, fate and transport in the environment. While these characteristics vary among the organochlorine compounds, they all exhibit an ability to resist degradation, partition into sediment, and to accumulate in the tissue of organisms, including invertebrates, fish, birds and mammals. The bioaccumulation of these compounds can adversely affect the health and reproductive success of aquatic organisms and their predators, and can pose a health threat to human consumers.

A TMDL technical report prepared by Regional Board staff [Ref. # 1] describes organochlorine-related problems in Newport Bay and its watershed and delineates the technical basis for the TMDLs that follow.

The waterbody-pollutant combinations for which organochlorine compounds TMDLs were established by the Regional Board are listed in Table NB-OCs-1. These TMDLs differ from those established by USEPA in 2002 in several respects:

First, based on an updated impairment assessment that utilized new data and applied the State Water Board's "Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List" (2004) [Ref. # 2], the Regional Board established TMDLs for a list of organochlorine compound-waterbody combinations different from that of USEPA. As shown in Table NB-OCs-2, USEPA also established TMDLs for dieldrin, chlordane, and PCBs in San Diego Creek and for dieldrin in Lower Newport Bay. In contrast, the Regional Board found no impairment as the result of dieldrin in any of these waters, nor was impairment due to chlordane or PCBs found in San Diego Creek and its tributaries.

As described in the TMDL technical report, Regional Board staff also found no impairment due to DDT in San Diego Creek or its tributaries. However, in adopting the 2006 Section 303(d) list (October 25, 2006, Resolution No. 2006-0079), the State Water Board found impairment due to DDT in Peter's Canyon Channel. In response, the Regional Board established a TMDL for DDT in San Diego Creek and its tributaries, including Peters Canyon Channel.

Second, corrections and modifications were made to loading capacities and existing loads identified in USEPA's TMDLs. Finally, an implementation plan is specified (see Section 4.b.3).

While the Regional Board did not establish TMDLs for chlordane and PCBs for San Diego Creek and tributaries, the Board did develop informational TMDLs for these substances in these waters, pursuant to Clean Water Act Section 303(d)(3). These informational TMDLs are shown in Table NB-OCs-3. This action was taken in light of several factors. First, the largest source of organochlorine compounds to Newport Bay is San Diego Creek. Second, the data suggest that the existing loading of chlordane to the Creek is greater than the loading capacity. This suggests that the lack of finding of impairment due to chlordane may be simply a reflection of a lack of data with which to assess impairment. Finally, these informational TMDLs may forward action to address organochlorine compound problems in the watershed. These informational TMDLs have no regulatory effect but may be used as the basis for further investigation of the relative contributions of the various sources of organochlorine compound inputs to San Diego Creek and thence the Bay. In the long-term, this would be expected to help assure proper apportionment of responsibility for implementation of the TMDLs identified in Table NB-OCs-1.

Table NB-OCs-1. Waterbody-pollutant combinations for which Organochlorine Compound TMDLs are established

<i>Waterbody</i>	<i>Pollutant</i>
San Diego Creek and tributaries	DDT, Toxaphene
Upper Newport Bay	Chlordane, DDT, PCBs
Lower Newport Bay	Chlordane, DDT, PCBs

Table NB-OCs-2. Waterbody-pollutant combinations for which Organochlorine Compounds TMDLs were established by USEPA (2002) and Regional Board (2007)

Waterbody	TMDLs	
	USEPA	Regional Board
San Diego Creek and tributaries*	Chlordane, dieldrin, DDT, PCBs, Toxaphene	DDT, Toxaphene
Upper Newport Bay	Chlordane, DDT, PCBs	Chlordane, DDT, PCBs
Lower Newport Bay	Chlordane, dieldrin, DDT, PCBs	Chlordane, DDT, PCBs

*TMDLs are established for San Diego Creek and tributaries, even if impairment was only found in particular reaches (e.g., SWRCB found DDT impairment in Peter's Canyon Channel, a primary tributary to San Diego Creek Reach 1, but the TMDL includes all of San Diego Creek and tributaries).

Table NB-OCs-3. Informational TMDLs

Waterbody	Informational TMDLs
San Diego Creek and tributaries	Chlordane, PCBs

4.b.1 Numeric Targets used in Organochlorine Compounds TMDLs

Numeric targets identify specific endpoints in sediment, water column or tissue that equate to attainment of water quality standards, which is the purpose of TMDLs. Multiple targets may be appropriate where a single indicator is insufficient to protect all beneficial uses and/or attain all applicable water quality objectives. The range of beneficial uses identified in this Basin Plan (see Chapter 3) for the waters addressed by the organochlorine compounds TMDLs makes clear that the targets must address the protection of aquatic organisms, wildlife (including federally listed threatened and endangered species) and human consumers of recreationally and commercially caught fish.

Sediment, water column and fish tissue targets are identified for these TMDLs, as shown in Table NB-OCs-4. The sediment and water column targets are identical to those selected by USEPA in the development of their organochlorine compounds TMDLs (2002). Fish tissue targets are added for the protection of aquatic life and wildlife.

The targets employed in the development of informational TMDLs for chlordane and PCBs in San Diego Creek and its tributaries are shown in Table NB-OCs-5.

Table NB-OCs-4. Numeric Sediment, Fish Tissue, and Water Column TMDL Targets

	Total DDT	Chlordane	Total PCBs	Toxaphene
Sediment Targets¹; units are µg/kg dry weight				
San Diego Creek and tributaries	6.98			0.1
Upper & Lower Newport Bay	3.89	2.26	21.5	
Fish Tissue Targets for Protection of Human Health²; units are µg/kg wet weight				
San Diego Creek and tributaries	100			30
Upper & Lower Newport Bay	100	30	20	
Fish Tissue Targets for Protection of Aquatic Life and Wildlife³; units are µg/kg wet weight				
San Diego Creek and tributaries	1000			100
Upper & Lower Newport Bay	50	50	500	
Water Column Targets for Protection of Aquatic Life, Wildlife & Human Health⁴ (µg/L)				
San Diego Creek and tributaries				
<i>Acute Criterion (CMC)</i>	1.1			0.73
<i>Chronic Criterion (CCC)</i>	0.001			0.0002
<i>Human Health Criterion</i>	0.00059			0.00075
Upper & Lower Newport Bay				
<i>Acute Criterion (CMC)</i>	0.13	0.09		
<i>Chronic Criterion (CCC)</i>	0.001	0.004	0.03	
<i>Human Health Criterion</i>	0.00059	0.00059	0.00017	

¹Freshwater and marine sediment targets, except toxaphene, are TELs from Buchman, M.F. 1999. NOAA Screening Quick Reference Tables, NOAA HAZMAT Report 99-1, Seattle WA, Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration, 12 pp. Toxaphene target is from N.Y. Dept. of Environmental Conservation.

²Freshwater and marine fish tissue targets for protection of human health are OEHHA SVs.

³Freshwater and marine fish tissue targets for protection of aquatic life and wildlife are from Water Quality Criteria 1972. A report of the Committee on Water Quality Criteria, Environmental Studies Board, National Academy of Sciences, National Academy of Engineering. Washington, D.C., 1972.

⁴Freshwater and marine targets are from California Toxics Rule (2000).

Table NB-OCs-5. Numeric Sediment, Fish Tissue, and Water Column Targets used in Informational TMDLs

	Chlordane	Total PCBs
Sediment Targets¹; units are µg/kg dry weight		
San Diego Creek and tributaries	4.5	34.1
Fish Tissue Targets for Protection of Human Health²; units are µg/kg wet weight		
San Diego Creek and tributaries	30	20
Fish Tissue Targets for Protection of Aquatic Life and Wildlife³; units are µg/kg wet weight		
San Diego Creek and tributaries	100	500
Water Column Targets for Protection of Aquatic Life, Wildlife & Human Health⁴ (µg/L)		
San Diego Creek and tributaries		
<i>Acute Criterion (CMC)</i>	2.4	
<i>Chronic Criterion (CCC)</i>	0.0043	0.014
<i>Human Health Criterion</i>	0.00059	0.00017

¹Freshwater sediment targets are TELs from Buchman, M.F. 1999. NOAA Screening Quick Reference Tables, NOAA HAZMAT Report 99-1, Seattle WA, Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration, 12 pp.

²Freshwater fish tissue targets for protection of human health are OEHHA SVs.

³Freshwater fish tissue targets for protection of aquatic life and wildlife are from Water Quality Criteria 1972. A report of the Committee on Water Quality Criteria, Environmental Studies Board, National Academy of Sciences, National Academy of Engineering. Washington, D.C., 1972.

⁴Freshwater targets are from California Toxics Rule (2000).

The linkage between adverse effects in sensitive wildlife species and concentrations of the organochlorine pollutants in sediments, prey organisms and water is not well understood at the present time, although work is underway to better understand ecological risk in Newport Bay. In addition, the State is in the process of developing sediment quality objectives that should provide guidance for assessing adverse effects due to pollutant bioaccumulation. Reducing contaminant loads in the sediment will result in progress toward reducing risk to aquatic life and wildlife. During implementation of these TMDLs, additional and/or modified wildlife or other targets will be identified as risk assessment information becomes available. These TMDLs will be revisited (see 4.b.3) and revised as appropriate.

4.b.2. Organochlorine Compounds TMDLs, Wasteload Allocations, Load Allocations and Compliance Dates

The organochlorine compounds TMDLs for San Diego Creek and its tributaries, Upper Newport Bay and Lower Newport Bay are shown in Tables NB-OCs-6 and NB-OCs-7. The TMDLs are expressed on a daily basis (average grams per day) in Table NB-OCs-6, and on an annual basis (grams per year) in Table NB-OCs-7. Expression of the TMDLs on a daily basis is intended to comply with a relevant court decision. However, because of the strong seasonality associated with the loading of organochlorine compounds during storm events, it is appropriate for implementation to occur based on average annual loadings. The TMDLs are to be achieved as soon as possible but no later than December 31, 2015.

Table NB-OCs-6. TMDLs for San Diego Creek, Upper and Lower Newport Bay (expressed on a "daily" basis to be consistent with the D.C. Circuit Court of Appeals decision in Friends of the Earth, Inc. v. EPA, et al., No. 05-5015 [D.C. Cir.2006])

Water Body	Pollutant	TMDL (average grams per day)^a
San Diego Creek and Tributaries	Total DDT	1.08
	Toxaphene	0.02
Upper Newport Bay	Total DDT	0.44
	Chlordane	0.25
	Total PCBs	0.25
Lower Newport Bay	Total DDT	0.16
	Chlordane	0.09
	Total PCBs	0.66

^a Compliance to be achieved as soon as possible but no later than December 31, 2015.

Table NB-OCs-7. TMDLs for San Diego Creek, Upper and Lower Newport Bay (expressed on annual basis for implementation purposes)

Water Body	Pollutant	TMDL (grams per year) ^a
San Diego Creek and Tributaries	Total DDT	396
	Toxaphene	6
Upper Newport Bay	Total DDT	160
	Chlordane	93
	Total PCBs	92
Lower Newport Bay	Total DDT	59
	Chlordane	34
	Total PCBs	241

^a Compliance to be achieved as soon as possible but no later than December 31, 2015.

Informational TMDLs for San Diego Creek and its tributaries for chlordane and total PCBs are shown in Table NB-OCs-8. Again, these informational TMDLs are expressed on average daily and annual bases.

Table NB-OCs-8. Informational TMDLs for San Diego Creek and Tributaries (expressed on average daily and annual bases)

Water Body	Pollutant	TMDL (average grams per day)
San Diego Creek and Tributaries	Chlordane	0.70
	Total PCBs	0.34
		TMDL (grams per year)
San Diego Creek and Tributaries	Chlordane	255
	Total PCBs	125

Wasteload and load allocations to achieve the TMDLs specified in Tables NB-OCs-6 and NB-OCs-7 are shown in Tables NB-OCs-9 and NB-OCs-10, respectively. Like the TMDLs, the allocations are expressed in terms of both average daily and annual loads. An explicit margin of safety (MOS) of ten percent was applied in calculating the allocations. Consistent with the TMDL compliance schedule, these allocations are to be achieved as soon as possible but no later than December 31, 2015.

Wasteload and load allocations necessary to meet the informational TMDLs shown in Table NB-OCs-8 are identified in Tables NB-OCs-11 (expressed as average daily loads) and NB-OCs-12 (expressed as annual loads). These allocations are identified only for informational purposes.

4.b.3. Implementation of Organochlorine Compounds TMDLs

These TMDLs are to be implemented within an adaptive management framework, with compliance monitoring, special studies, and stakeholder interaction guiding the process over time. Information obtained from compliance monitoring will measure progress towards achievement of WLAs and LAs, potentially leading to changes to TMDL allocations; ongoing investigations and recommended special studies, if implemented, may provide information that leads to revisions of the TMDLs, adjustments to the implementation schedule, and/or improved implementation strategies. Thus, implementation of the TMDLs is expected to be an ongoing and dynamic process.

The implementation plan identified in this section reflects the adaptive management, phased approach to the organochlorine compound TMDLs adopted by the Regional Board. The Board found a phased approach, with compliance schedules, appropriate in light of the following considerations. First, it was recognized that additional monitoring and special studies were either already underway or would be needed to address data limitations and significant uncertainty associated with the TMDL calculations, and that changes to the TMDLs might be appropriate based on the results of those investigations. Second, it was also understood that these data limitations and uncertainties pertained to the impairment assessment itself and the determination of the specific organochlorine compounds for which TMDLs are required. Third, the natural attenuation of these compounds over time is expected to affect significantly the selection, development and implementation of TMDLs. As described in the TMDL technical report [Ref. 1], use of the organochlorine compounds addressed by these TMDLs has been banned for many years and trend analyses indicate declining concentrations of these substances in fish tissue over time. Natural attenuation should eventually reduce organochlorine pollutant levels to concentrations that pose no threat to beneficial uses in San Diego Creek or Newport Bay. While natural degradation of these compounds is likely the principal cause of the observed decline in fish tissue concentrations, the implementation of erosion and sediment controls and other Best Management Practices to address compliance with the sediment and nutrient TMDLs for Newport Bay and its watershed (see

Table NB-OCs-9. TMDLs and Allocations for San Diego Creek, Upper and Lower Newport Bay (expressed on a “daily” basis to be consistent with the recent D.C. Circuit Court of Appeals decision in Friends of the Earth, Inc. v. EPA, et al., No. 05-5015 [D.C. Cir.2006]).^{a,b}

		Total DDT	Chlordane	Total PCBs	Toxaphene
Type		(average grams/day)			
San Diego Creek					
WLA	Urban Runoff – County MS4 (36%)	0.35			0.005
	Construction (28%)	0.27			0.004
	Commercial Nurseries (4%)	0.04			0.001
	Caltrans MS4 (11%)	0.11			0.002
	Subtotal – WLA (79%)	0.77			0.01
LA	Agriculture (5%) (excludes nurseries under WDRs)	0.05			0.001
	Open Space (9%)	0.09			0.001
	Streams &Channels (2%)	0.02			0.0003
	Undefined (5%)	0.05			0.001
	Subtotal – LA (21%)	0.21			0.003
MOS (10% of total TMDL)		0.11			0.002
Total TMDL		1.08			0.02
Upper Newport Bay					
WLA	Urban Runoff - County MS4 (36%)	0.14	0.08	0.08	
	Construction (28%)	0.11	0.06	0.06	
	Commercial Nurseries (4%)	0.02	0.01	0.01	
	Caltrans MS4 (11%)	0.04	0.03	0.02	
	Subtotal – WLA (79%)	0.31	0.18	0.18	
LA	Agriculture (5%) (excludes nurseries under WDRs)	0.02	0.01	0.01	
	Open Space (9%)	0.04	0.02	0.02	
	Streams & Channels (2%)	0.01	0.005	0.005	
	Undefined (5%)	0.02	0.01	0.01	
	Subtotal – LA (21%)	0.08	0.05	0.05	
MOS (10% of Total TMDL)		0.04	0.03	0.03	
Total TMDL		0.44	0.25	0.25	
Lower Newport Bay					
WLA	Urban Runoff – County MS4 (36%)	0.05	0.03	0.21	
	Construction (28%)	0.04	0.02	0.17	
	Commercial Nurseries (4%)	0.01	0.003	0.02	
	Caltrans MS4 (11%)	0.02	0.01	0.07	
	Subtotal – WLA (79%)	0.11	0.07	0.47	
LA	Agriculture (5%) (excludes nurseries under WDRs)	0.01	0.004	0.03	
	Open Space (9%)	0.01	0.01	0.05	
	Streams & Channels (2%)	0.003	0.002	0.01	
	Undefined (5%)	0.01	0.004	0.03	
	Subtotal – LA (21%)	0.03	0.02	0.12	
MOS (10% of Total TMDL)		0.02	0.01	0.07	
Total TMDL		0.16	0.09	0.66	

^a Percentages for WLA (79%) and LA (21%) are applied to the TMDL, after subtracting the 10% MOS from the Total TMDL. Percent WLA and Percent LA add to 100%.

^b Compliance to be achieved as soon as possible but no later than December 31, 2015.

Table NB-OCs-10. TMDLs and Allocations for San Diego Creek, Upper and Lower Newport Bay (expressed on an “annual” basis for implementation purposes).^{a, b}

		Total DDT	Chlordane	Total PCBs	Toxaphene
	Type	(grams per year)			
San Diego Creek					
WLA	Urban Runoff – County MS4 (36%)	128.3			1.9
	Construction (28%)	99.8			1.5
	Commercial Nurseries (4%)	14.3			0.2
	Caltrans MS4 (11%)	39.2			0.6
	Subtotal – WLA (79%)	281.6			4.3
LA	Agriculture (5%) (excludes nurseries under WDRs)	17.8			0.3
	Open Space (9%)	32.1			0.5
	Streams & Channels (2%)	7.1			0.1
	Undefined (5%)	17.8			0.3
	Subtotal – LA (21%)	74.8			1.1
MOS (10% of Total TMDL)		40			0.6
Total TMDL		396			6
Upper Newport Bay					
WLA	Urban Runoff – County MS4 (36%)	51.8	30.1	29.8	
	Construction (28%)	40.3	23.4	23.2	
	Commercial Nurseries (4%)	5.8	3.3	3.3	
	Caltrans MS4 (11%)	15.8	9.2	9.1	
	Subtotal – WLA (79%)	113.8	66.1	65.4	
LA	Agriculture (5%) (excludes nurseries under WDRs)	7.2	8	7	
	Open Space (9%)	13.0	7.6	7.5	
	Streams & Channels (2%)	2.9	1.7	1.7	
	Undefined (5%)	7.2	4.2	4.2	
	Subtotal – LA (21%)	30.2	21.4	20.3	
MOS (10% of Total TMDL)		16	9	9	
Total TMDL		160	93	92	
Lower Newport Bay					
WLA	Urban Runoff – County MS4 (36%)	19.1	11.0	78.1	
	Construction (28%)	14.9	8.6	60.7	
	Commercial Nurseries (4%)	2.1	1.2	8.7	
	Caltrans MS4 (11%)	5.8	3.4	23.9	
	Subtotal – WLA (79%)	41.9	24.2	171.4	
LA	Agriculture (5%) (excludes nurseries under WDRs)	2.7	1.5	10.8	
	Open Space (9%)	4.8	2.8	19.5	
	Streams & Channels (2%)	1.1	0.6	4.3	
	Undefined (5%)	2.7	1.5	10.8	
	Subtotal – LA (21%)	11.2	6.4	45.5	
MOS (10% of Total TMDL)		5.9	3.4	24	
Total TMDL		59	34	241	

^a Percentages for WLA (79%) and LA (21%) are applied to the TMDL, after subtracting the 10% MOS from the total TMDL. Percent WLA and Percent LA add to 100%.

^b Compliance to be achieved as soon as possible but no later than December 31, 2015.

Table NB-OCs-11. Informational TMDLs and Allocations for San Diego Creek (expressed on a “daily” basis)^a

Category	Type	Chlordane	Total PCBs
		(average grams per day)	
San Diego Creek			
WLA	Urban Runoff – County MS4 (36%)	0.23	0.11
	Construction (28%)	0.18	0.09
	Commercial Nurseries (4%)	0.03	0.01
	Caltrans MS4 (11%)	0.07	0.03
	Subtotal – WLA (79%)	0.50	0.24
LA	Agriculture (5%) (excludes nurseries under WDRs)	0.03	0.02
	Open Space (9%)	0.06	0.03
	Streams & Channels (2%)	0.01	0.01
	Undefined (5%)	0.03	0.02
	Subtotal – LA (21%)	0.13	0.08
MOS (10% of total TMDL)		0.07	0.03
Total TMDL		0.70	0.34

^a Percentages for WLA (79%) and LA (21%) are applied to the TMDL after subtracting the 10% MOS from the Total TMDL. Percent WLA and Percent LA add to 100%.

Table NB-OCs-12. Informational TMDLs and Allocations for San Diego Creek (expressed on an “annual” basis)^a

Category	Type	Chlordane	Total PCBs
		(grams per year)	
San Diego Creek			
WLA	Urban Runoff – County MS4 (36%)	82.6	40.5
	Construction (28%)	64.3	31.5
	Commercial Nurseries (4%)	9.2	4.5
	Caltrans MS4 (11%)	25.2	12.4
	Subtotal – WLA (79%)	181.3	88.9
LA	Agriculture (5%) (excludes nurseries under WDRs)	11.5	5.6
	Open Space (9%)	20.7	10.1
	Streams & Channels (2%)	4.6	2.3
	Undefined (5%)	11.5	5.6
	Subtotal – LA (21%)	48.2	23.6
MOS (10% of total TMDL)		26	13
Total TMDL		255	125

^a Percentages for WLA (79%) and LA (21%) are applied to the TMDL, after subtracting the 10% MOS from the total TMDL. Percent WLA and Percent LA add to 100%.

discussions of these TMDLs elsewhere in this Basin Plan) is a probable factor. In any case, the observed trends suggest that as monitoring continues in the watershed and pollutant levels decline, some or all of the organochlorine compounds may warrant delisting from the Clean Water Act Section 303(d) list of impaired waters. Again, these TMDLs would need to be revisited accordingly.

This implementation plan also reflects recommendations by regulated stakeholders in the Newport Bay watershed to convene a Working Group to develop and implement a comprehensive Work Plan to: address, as an early action item, the technical uncertainties in these TMDLs and make recommendations for revisions, as appropriate; identify and prioritize tasks necessary to implement the TMDLs; integrate TMDL implementation tasks with those already being conducted in response to other programs (e.g., permits, other TMDLs); and, investigate other pollutants of concern in the watershed.

Table NB-OCs-13 lists the tasks and schedules needed to implement the organochlorine TMDLs. This implementation plan is aimed at identifying actions to accelerate the decline in organochlorine compound concentrations in the watershed, and to augment their natural attenuation. The implementation plan is focused to a large extent on the monitoring and, where necessary, enhanced implementation of Best Management Practices (BMPs) to reduce the erosion and transport to surface waters of fine sediment to which the organochlorine compounds tend to adhere. Many of these BMPs are already in place as the result of existing permits issued by the Regional Board or State Water Resources Control Board for stormwater and construction activities, and/or in response to established TMDLs. The intent is to

assure that source control activities are implemented to reduce any active sources of the organochlorine compounds, and in other areas where such actions will be most effective in meeting the TMDL goals. Monitoring and special study requirements are included to provide for TMDL compliance assessment and refinement.

In response to the recommendation by watershed stakeholders, this implementation plan provides an opportunity for dischargers to participate in the development and implementation of a comprehensive Work Plan. The implementation tasks identified in Table NB-OCs-13 (except Tasks 1 and 4; see discussion of Task 7, below) will be considered in the development of the Work Plan and incorporated, as appropriate. Implementation of the Work Plan, which will be approved by the Regional Board at a public hearing, will obviate the need for individual actions on the tasks in Table NB-OCs-13 by members of the Working Group. Completion of the Work Plan will result, in part, in recommendations for revisions to these TMDLs based on review by an Independent Advisory Panel and the results of ongoing or requisite monitoring and investigations, and in the development of a comprehensive plan for BMPs and other actions needed to assure compliance with the TMDLs, wasteload allocations and load allocations as soon as possible after completion of execution of the Work Plan but no later than December 31, 2015¹. Dischargers who elect not to participate in the Work Plan approach will be required to implement the tasks shown in Table NB-OCs-13, as appropriate.

Each of the tasks identified in Table NB-OCs-13 is described below.

¹ This compliance schedule and/or the organochlorine compounds TMDLs may be modified, through the Basin Planning process, in response to information provided by implementation of the Work Plan tasks and/or other investigations.

Table NB-OCs-13. Organochlorine Compounds TMDLs Implementation Tasks and Schedule

Task	Description	Compliance Date – As Soon As Possible But No Later Than ^b
PHASE I IMPLEMENTATION		
1	Revise existing WDRs and NPDES permits: <i>Commercial Nursery WDRs, MS4 Permit, Other NPDES Permits</i>	Upon OAL approval of BPA and permit renewal
2 ^a	a. Develop proposed agricultural BMP and monitoring program to assess and control OCs discharges. b. Implement program	a. (3 months after OAL approval of BPA) b. Upon Regional Board approval
3 ^a	a. Identify responsible parties for open space areas b. Develop proposed monitoring program to assess OCs inputs from open space areas c. Implement proposed monitoring program d. Develop plan to implement effective erosion and sediment control BMPs for management of fine particulates (if found necessary based on monitoring results) e. Implement BMP plan	a. (1 month after OAL approval of BPA) b. 2 months after notification of responsible parties c. Upon Regional Board approval d. Within 6 months of notification of need to develop plan e. Upon Regional Board approval
4 ^a	Implement effective sediment and erosion control BMPs for management of fine particulates on construction sites: Regional Board: a. Develop SWPPP Improvement Program MS4 permittees: b. Revise planning processes as necessary to assure proper communication of SWPPP requirements c. Evaluate/implement BMPs effective in reducing/eliminating organochlorine discharges: i. Submit proposed plan and schedule for BMP studies and implement plan ii. Submit studies report; including plan and schedule to implement BMPs/include in Guidance Manual iii. Implement BMPs/include in Guidance Manual	a. (Upon OAL approval of BPA) b. Within 3 months of appropriate revision of the MS4 permit c. i. Submit plan within 3 months of 13267 letter issuance/MS4 permit revision and implement upon Executive Officer approval; ii. Within 6 months of completion of studies plan; iii. Upon Executive Officer approval
5 ^a	Evaluate sources of OCs; develop and implement BMPs accordingly: a. Submit proposed plan and schedule for source	a. Submit plan within 3 months of 13267 letter issuance/appropriate revision of the MS4 permit

	area investigations b. Implement investigation plan c. Submit report of investigation findings and plan/schedule for implementation of BMPs d. Implement BMP plan	b. Upon Executive Officer approval c. Within 6 months of completion of investigation plan d. Upon Executive Officer approval
6 ^a	Evaluate feasibility and mechanisms to fund future dredging operations within San Diego Creek, Upper and Lower Newport Bay	Submit feasibility/funding report within <i>(3 years after OAL approval of BPA)</i>
7	Develop comprehensive Work Plan to meet TMDL implementation requirements, consistent with an adaptive management approach <ul style="list-style-type: none"> a. Convene Working Group b. Submit proposed Work Plan c. Implement Work Plan d. Complete execution of Work Plan 	<ul style="list-style-type: none"> a. <i>(one month of OAL approval of BPA)</i> b. <i>(3 months after OAL approval of BPA)</i> c. Upon Regional Board approval d. Within 5 years of Work Plan approval
8 ^a	Revise regional monitoring program	<i>(3 months after OAL approval of BPA); Annual Reports due November 15</i>
9	Conduct special studies	As funding allows, and in order of priority identified in comprehensive Work Plan (Task 7), if applicable
PHASE II IMPLEMENTATION		
10	Review TMDLs, including numeric targets, WLAs and LAs; delist or revise TMDLs pursuant to established Sediment Quality Objectives, new data, and results of special studies	No later than <i>(5 years from OAL approval of BPA)</i>

- a. The tasks and schedules identified in the Regional Board approved Work Plan developed by the Working Group shall govern implementation activities by members of the Working Group.
- b. Final compliance with the TMDLs to be achieved no later than December 31, 2015.

Table NB-OCs-14. Existing NPDES Permits and WDRs Regulating Discharges in the Newport Bay Watershed

No.	Permit Title	Order No.	NPDES No.
1	Waste Discharge Requirements for the United States Department of the Navy, Former Marine Corps Air Station Tustin, Discharge to Peters Canyon Wash in the San Diego Creek/Newport Bay Watershed	R8-2006-0017	CA8000404
2	Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the Incorporated Cities of Orange County within the Santa Ana Region - Areawide Urban Storm Water Runoff - Orange County (MS4 permit)	R8-2002-0010	CAS618030
3	National Pollutant Discharge Elimination System (NPDES) Permit Statewide Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans)	99-06-DWQ	CAS000003
4	General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant (de minimus) Threat to Water Quality	R8-2003-0061 as amended by R8-2005-0041 and R8-2006-0004	CAG998001
5	General Waste Discharge Requirements for Short-term Groundwater-Related Dischargers and De Minimus Wastewater Discharges to Surface Waters Within the San Diego Creek/Newport Bay Watershed	R8-2004-0021	CAG998002
6	General Groundwater Cleanup Permit for Discharges to Surface Waters of Extracted and Treated Groundwater Resulting from the Cleanup of Groundwater Polluted by Petroleum Hydrocarbons, Solvents and/or Petroleum Hydrocarbons mixed with Lead and/or Solvents	R8-2002-0007, as amended by R8-2003-0085 and R8-2005-0110	CAG918001
7	Waste Discharge Requirements for City of Tustin's 17th Street Desalter	R8-2002-0005	CA8000305
8	Waste Discharge Requirements for City of Irvine, Groundwater Dewatering Facilities, Irvine, Orange County,	R8-2005-0079	CA8000406
9	Waste Discharge Requirements for Bordiers Nursery, Inc.	R8-2003-0028	
10	Waste Discharge Requirements Hines Nurseries, Inc.	R8-2004-0060	
11	Waste Discharge Requirements for El Modeno Gardens, Inc., Orange County	R8-2005-0009	
12	Waste Discharge Requirements for Nakase Bros. Wholesale Nursery, Orange County	R8-2005-0006	

Phase I Implementation

Task 1: WDRs and NPDES Permits

The Regional Board shall review and revise, as necessary, existing NPDES permits and/or WDRs to incorporate the appropriate TMDL WLAs, compliance schedules, and monitoring program requirements. These permits are identified in Table NB-OCs-14. The appropriate TMDL WLAs, compliance schedules and monitoring program requirements shall be included in new NPDES permits/WDRs. The NPDES permits/WDRs shall specify TMDL-related provisions that apply provided that: (1) the dischargers are and remain members of the Working Group (see Task 7); and (2) the approved Work Plan developed by the Working Group is implemented in a timely and effective manner. The NPDES permit/WDRs shall also include TMDL-related provisions that apply if the discharger(s) do not participate or discontinue participation in the Working Group and/or if the approved Work Plan is not implemented effectively or in a timely manner.

Compliance with the TMDLs and wasteload allocations is to be achieved as soon as possible, but no later than December 31, 2015. The way that this deadline applies to a particular discharger differs depending on whether the discharger is participating in the Working Group:

1. Working Group Participants. Provisions in NPDES permits/WDRs issued during implementation of the Work Plan will specify the following for Working Group members:

(a) Interim effluent limitations. Participation in the Working Group and timely and effective implementation of the Regional Board-approved Work Plan will constitute interim, performance-based effluent limitations to implement the wasteload allocations. Adhering to these interim effluent limitations satisfies the requirement, during the Work Plan implementation period, to achieve compliance with the TMDLs and wasteload allocations "as soon as possible."

(b) Final effluent limitations. Final effluent limitations based on the wasteload allocations will also be specified, with a schedule requiring compliance as soon as possible but no later than December 31, 2015.² Compliance with the interim, performance-based limitations will fulfill the "as soon as possible" requirement. The NPDES permits/WDRs will specify further that the status of compliance with the final effluent limitations based on the wasteload allocations will be reviewed on an annual basis. Compliance with these limitations will be required prior to the completion of the Work Plan tasks, in accordance with a schedule approved by the Regional Board's Executive Officer, if it is demonstrated to the satisfaction of the Executive Officer that such earlier compliance is reasonably feasible.

² It is recognized that this schedule may exceed the five year terms of NPDES permits. This schedule will be reflected in subsequent renewals of these NPDES permits.

Following the completion of the Work Plan tasks, NPDES permits/WDRs will require dischargers to comply with wasteload allocations in the shortest practicable time, but in no event later than December 31, 2015.

2. Non-Working Group Dischargers. For dischargers not participating in the Working Group, NPDES permit/WDR provisions will require compliance with the wasteload allocations as soon as possible after adoption of NPDES permits/WDRs that implement the TMDLs, but no later than December 31, 2015. In this case, the determination of what constitutes "as soon as possible" will be at the discretion of the Regional Board's Executive Officer.

Completion of the Work Plan and/or other investigations conducted by the Regional Board or others may result in modification of the TMDLs, wasteload allocations and the compliance schedule through the Basin Planning process. Subsequent issuance/revision of NPDES permit/WDRs will implement any such changes.

Ultimate compliance with permit limitations based on wasteload allocations is expected to be based upon iterative implementation of effective BMPs to manage the discharge of fine sediments containing organochlorine compounds, along with monitoring to measure BMP effectiveness.

Permit revisions shall be accomplished as soon as possible upon approval of these TMDLs. Given Regional Board resource constraints and the need to consider other program priorities, permit revisions are likely to be tied to renewal schedules.

For commercial nurseries covered under existing WDRs, revisions of these WDRs shall address the following identified needs:

- (1) Evaluation of sites to determine/verify potential storm water and nonstorm water discharge locations;
- (2) Evaluation of current monitoring programs and methods of sampling and analysis for consistency with other monitoring efforts in the watershed;
- (3) In cooperation with U.C. Cooperative Extension, evaluation of BMPs for adequacy and implementation of the most effective BMPs to reduce/eliminate the discharge of potentially-contaminated fine sediments in both storm water and non-storm water discharges;
- (4) Monitoring to better quantify nursery runoff as a potential source of organochlorine compounds and to assure that load reductions are achieved; and
- (5) Based on the results of the preceding tasks, development of a workplan to be submitted within one month of the effective date of these TMDLs that identifies: (a) the BMPs implemented to date and their effectiveness in reducing fine sediment and organochlorine compound discharges; (b) the adequacy and consistency of monitoring efforts, and proposed improvements; (c) a plan and schedule for implementation of revised BMPs and monitoring protocols, where appropriate. It is recognized that

most nursery operations are likely to be of very limited duration due to the expiration of land leases. The workplan shall identify recommendations for BMP and monitoring improvements that are effective, reasonable and practicable, taking this consideration into account. This workplan shall be implemented upon approval by the Regional Board Executive Officer.

Revisions to the Municipal Separate Storm Sewer System (MS4) permit (R8-2002-0010, NPDES No. CAS618030), including the monitoring program shall address the monitoring and BMP-related tasks identified below, as appropriate. The Regional Board will coordinate also with the State Water Resources Control Board regarding revision of the Caltrans permit to address these monitoring and BMP-related tasks. These include: oversight and implementation of construction BMPs (Task 4); organochlorine compound source evaluations (Task 5); assessment of dredging feasibility and identification of a funding mechanism (Task 6); and, revision of the regional monitoring program (Task 8).

NPDES permits that regulate discharges of ground water to San Diego Creek or its tributaries shall be reviewed and revised as necessary to require annual (at a minimum) monitoring, using the most sensitive analytical techniques practicable, to analyze for organochlorine compounds in the discharges. If organochlorine compounds are found to be present, the dischargers shall be required to evaluate whether and to what extent the discharges would cause or contribute to an exceedance of wasteload allocations and to implement appropriate measures to reduce or eliminate organochlorine compounds in the discharges. New NPDES permits issued for these types of discharges shall incorporate the same requirements.

These dischargers (nurseries, MS4 permittees, Caltrans, ground water dischargers) may address the specific requirements identified above through their participation in the development and implementation of an appropriate, Regional Board approved Work Plan (see Task 7).

Task 2: Develop and Implement an Agricultural BMP and Monitoring Program

Apart from certain nurseries, agricultural operations in the watershed are not currently regulated pursuant to waste discharge requirements. The SWRCB's "Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program" (Nonpoint Source Policy) (2004) requires that all nonpoint source dischargers be regulated under WDRs, waivers of WDRs, Basin Plan prohibitions, or some combination of these three administrative tools. Board staff is developing recommendations for an appropriate regulatory approach to address agricultural discharges. It is expected that the Regional Board will be asked to consider these recommendations and to approve a regulatory approach in late 2007. Appropriate load allocations to implement these TMDLs will be included in WDRs or a waiver of

WDRs, if and when issued by the Regional Board to address discharges from agricultural operations.

In the interim, agricultural operators shall identify and implement a monitoring program to assess OCs discharges from their facilities, and identify and implement a BMP program designed to reduce or eliminate those discharges. The proposed monitoring and BMP program shall be submitted as soon as possible but no later than *(3 months from OAL approval of this Basin Plan Amendment (BPA))*. These monitoring and BMP programs will be components of the waste discharge requirements or conditional waiver of waste discharge requirements that Board staff will recommend to implement the Nonpoint Source Policy. Load allocations identified in these TMDLs will also be specified in the WDRs/waiver, with a schedule of compliance.

It is recognized that most agricultural operations are expected to be of very limited duration due to the expiration of land leases. The monitoring and BMP programs proposed by the agricultural operators should include recommendations that are effective, reasonable and practicable, taking this consideration into account. The BMP and monitoring programs shall be implemented upon approval by the Regional Board. The BMP and monitoring programs may be implemented individually or by a group or groups of agricultural operators.

In addition, responsible parties may address these BMP/monitoring program requirements through their participation in the development and implementation of an appropriate, Regional Board approved Work Plan (see Task 7). WDRs or conditional waivers of WDRs issued to agricultural operators pursuant to the Nonpoint Source Policy shall specify that for those operators who participate in the development and implementation of a Regional Board approved Work Plan, compliance with the TMDLs and load allocations is to be achieved as soon as possible, but no later than December 31, 2015. The way that this deadline applies to a particular agricultural operator differs depending on whether the operator is participating in the Working Group:

1. Working Group Participants. Provisions in WDRs or conditional waivers of WDRs issued during implementation of the Work Plan will specify the following for Working Group members:

(a) Interim limitations: Participation in the Working Group and timely and effective implementation of the Regional Board-approved Work Plan will constitute interim, performance-based limitations to implement the load allocations. Adherence to these interim limitations satisfies the requirement, during the Work Plan implementation period, to achieve compliance with the TMDLs and load allocations "as soon as possible."

(b) Final limitations: Final limitations based on the load allocations will also be specified in the WDRs/waivers, with a schedule requiring compliance as soon as

possible but no later than December 31, 2015. Compliance with the interim, performance-based limitations will fulfill the "as soon as possible" requirement. The WDRs/waivers will specify further that the status of compliance with the final limitations based on the load allocations will be reviewed on an annual basis. Compliance with these limitations will be required prior to the completion of the Work Plan tasks, in accordance with a schedule approved by the Regional Board's Executive Officer, if it is demonstrated to the satisfaction of the Executive Officer that such earlier compliance is reasonably feasible.

Following the completion of the Work Plan tasks, WDRs/waivers will require agricultural operators to comply with load allocations in the shortest practicable time, but in no event later than December 31, 2015.

2. Non-Working Group Dischargers. For agricultural operators not participating in the Working Group, provisions in WDR/waivers of WDRs will require compliance with the load allocations as soon as possible after adoption of WDRs/waivers of WDRs that implement the TMDLs, but no later than December 31, 2015. In this case, the determination of what constitutes "as soon as possible" will be at the discretion of the Regional Board's Executive Officer.

Completion of the Work Plan and/or other investigations conducted by the Regional Board or others may result in modification of the TMDLs, load allocations and the compliance schedule through the Basin Planning process. Subsequent issuance/revision of WDRs/conditional waivers of WDRs will implement any such changes.

Task 3: Identify Parties Responsible for Open Space Areas; Develop and Implement an OCs Monitoring Program to Assess Open Space Discharges; Develop and Implement an OCs BMP Program, if Necessary

Nonpoint source discharges from open space are also subject to State regulation. During Phase I of these TMDLs, sufficient data shall be collected by the responsible parties to determine whether discharges of OCs from designated open space, as well as discharges resulting from erosion in and adjacent to unmodified streams, are causing or contributing to exceedances of water quality objectives and/or impairment of beneficial uses of San Diego Creek and Newport Bay. With the assistance of the stakeholders, Regional Board staff will identify the responsible parties as soon as possible but no later than *(one month from OAL approval of this BPA)*. Board staff will notify the identified responsible parties of their obligation to propose an organochlorine compound monitoring program within two months of notification. The monitoring program shall be implemented upon Regional Board approval.

Based on the results of this monitoring program, the responsible parties shall develop a BMP implementation plan within 6 months of notification by the Regional

Board's Executive Officer of the need to do so. The responsible parties shall implement that plan upon Regional Board approval.

The responsible parties may address these monitoring and BMP implementation program requirements through their participation in the development and implementation of an appropriate, Regional Board approved Work Plan (see Task 7).

The Regional Board will consider whether WDRs or a WDR waiver is necessary and appropriate for responsible parties not currently regulated, based on the monitoring results. WDRs or a WDR waiver, if issued, will include appropriate load allocations to implement these TMDLs. For responsible parties compliance with the TMDLs and load allocations is to be achieved as soon as possible, but no later than December 31, 2015. The way that this deadline applies to a particular responsible party differs depending on whether that responsible party is participating in the Working Group:

1. Working Group Participants. Provisions in WDRs or conditional waivers of WDRs issued during implementation of the Work Plan will specify the following for Working Group members:

(a) Interim limitations: Participation in the Working Group and timely and effective implementation of the Regional Board-approved Work Plan will constitute interim, performance-based limitations to implement the load allocations. Adherence to the interim, performance-based limitations satisfies the requirement, during the Work Plan implementation period, to achieve compliance with the TMDLs and load allocations "as soon as possible."

(b) Final limitations: Final limitations based on the load allocations will also be specified in the WDRs/waivers, with a schedule requiring compliance as soon as possible but no later than December 31, 2015. Compliance with the interim, performance-based limitations will fulfill the "as soon as possible" requirement. The WDRs/waivers will specify further that the status of compliance with the final limitations based on the load allocations will be reviewed on an annual basis. Compliance with the final limitations will be required prior to the completion of the Work Plan tasks, in accordance with a schedule approved by the Regional Board's Executive Officer, if it is demonstrated to the satisfaction of the Executive Officer that such earlier compliance is reasonably feasible.

Following the completion of the Work Plan tasks, WDRs/waivers will require responsible parties to comply with load allocations in the shortest practicable time, but in no event later than December 31, 2015.

2. Non-Working Group Dischargers. For responsible parties not participating in the Working Group, compliance with the load allocations will be as soon as possible after TMDLs adoption and approval, but no later than December 31, 2015. In this

case, the determination of what constitutes “as soon as possible” will be at the discretion of the Regional Board’s Executive Officer.

Completion of the Work Plan and/or other investigations conducted by the Regional Board or others may result in modification of the TMDLs, load allocations and the compliance schedule through the Basin Planning process. Subsequent issuance/revision of WDRs/conditional waivers of WDRs will implement any such changes.

Task 4: Develop and Implement Appropriate BMPs for Construction Activities

Currently, all construction activities in the watershed are regulated under the State Water Resource Control Board’s (SWRCB) General Permit for Discharge of Storm Water Runoff Associated with Construction Activity (Order No. 99-08-DWQ, NPDES No. CAS000002; the “General Construction Permit”), SWRCB National Pollutant Discharge Elimination System (NPDES) Permit Statewide Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans) (Order No. 99-06-DWQ, NPDES No. CAS000003; the Caltrans MS4 permit), and/or the Orange County MS4 NPDES permit. The requirements of these permits and an iterative, adaptive-management BMP approach, coupled with monitoring, are the foundation for meeting the TMDL WLAs for construction. The General Construction Permit, and the Orange County and Caltrans MS4 permits are expected to be revised over time. The specific tasks identified below may be addressed by revisions to one or more of these permits. In that case, the Regional Board will integrate requirements for implementation of this Task with the requirements of the Orange County and Caltrans MS4/General Construction permits so as to prevent conflict and/or duplication of effort.

To assure that effective construction BMPs are identified and implemented, program improvements are needed in the following areas: (a) Storm Water Pollution Prevention Plans (SWPPPs) prepared in response to the General Construction Permit must include supporting documentation and assumptions for selection of sediment and erosion control BMPs, and must state why the selected BMPs will meet the Construction WLAs for the organochlorine compounds; (b) SWPPP provisions must be rigorously implemented on construction sites; (c) sampling and analysis for the organochlorine pesticides and PCBs in storm and nonstorm discharges containing sediment from construction sites is necessary to determine the efficacy of BMPs, as well as compliance with the construction WLAs; sampling and analysis plans must be included in SWPPPs; (d) additional BMPs, including enhanced BMPs, must be evaluated to determine those that may be appropriate for reducing or eliminating organochlorine compound discharges from construction sites (e.g., BMPs effective in control of fine particulates) without significant adverse environmental effects (e.g., toxicity that might result from improper storage and/or application of polymers); (e) outreach is necessary to assure the effective implementation of these SWPPP requirements; and (e) enforcement of the SWPPP requirements is necessary.

To address these program improvements, Regional Board staff shall develop a SWPPP Improvement Program that identifies the Regional Board's expectations with respect to the content of SWPPPs, including documentation regarding the selection and implementation of BMPs, and a sampling and analysis plan. The Improvement Program shall include specific guidance regarding the development and implementation of monitoring plans, including the constituents to be monitored, sampling frequency and analytical protocols. The SWPPP Improvement Program shall be completed by *(the date of OAL approval of this BPA)*. No later than two months from completion of the Improvement Program, Board staff shall assure that the requirements of the Program are communicated to interested parties, including dischargers with existing authorizations under the General Construction Permit. Existing, authorized dischargers shall revise their project SWPPPs as needed to address the Program requirements as soon as possible but no later than *(three months of completion of the SWPPP Improvement Program)*. Applicable SWPPPs that do not adequately address the Program requirements shall be considered inadequate and enforcement by the Regional Board shall proceed accordingly. The Caltrans and Orange County MS4 permits shall be revised as needed to assure that the permittees communicate the Regional Board's SWPPP expectations, based on the SWPPP Improvement Program, with the Standard Conditions of Approval.

The MS4 permittees shall conduct studies to evaluate BMPs that are most appropriate for reducing or eliminating organochlorine compound discharges from construction sites (e.g., fine particulates), including advanced treatment BMPs. The evaluation shall consider the potential for adverse environmental effects associated with implementation of each of the BMPs identified. MS4 Permittees shall include these BMPs in the Orange County Stormwater Program Construction Runoff Guidance Manual and the Caltrans Storm Water Management Plan (SWMP). Implementation of these MS4 permittee requirements shall commence upon issuance of appropriate Water Code Section 13267 letters or renewal of the MS4 permits, whichever occurs first. The Section 13267 letters/revised permits shall require the permittees to: (a) submit a proposed plan and schedule for studies to evaluate appropriate BMPs, as described above, within three months of issuance of the 13267 letter or permit revision; (b) implement the plan and schedule upon approval by the Regional Board's Executive Officer; (c) submit a report of the BMP investigations within 6 months of approval of the study plan, provided that sufficient storms, as defined in the study plan, have occurred within that period. If the number of storms does not conform to the study plan, then the report shall be submitted in accordance with a schedule approved by the Executive Officer once the requisite number of storms has occurred. The report shall include a proposed plan and schedule for implementation of the BMPs, as appropriate, and inclusion of the BMPs in the Orange County Guidance Manual and in the Caltrans SWMP and related guidance documents; (d) implement the BMP plan upon approval by the Executive Officer.

The MS4 permittees may address these SWPPP and construction site BMP-related requirements through their participation in the development and implementation of an appropriate, Regional Board approved Work Plan (see Task 7).

**Task 5: Evaluate Sources of OCs to San Diego Creek and Newport Bay;
Identify and Implement Effective BMPs to Reduce/Eliminate Sources**

Based on the regional monitoring program being implemented by the Orange County MS4 permittees and/or on the results of other monitoring and investigations, all MS4 permittees shall conduct source analyses in areas tributary to the MS4 system demonstrating elevated concentrations of OCs. Based on mass emissions monitoring (described below) and source analysis, the permittees shall implement additional/enhanced BMPs as necessary to ensure that organochlorine discharges from significant land use sources to surface waters are reduced or eliminated. As part of the investigation task, if the results indicate that additional OCs soil remediation is necessary on MCAS Tustin and MCAS El Toro, the responsible parties for such remediation will be identified. The responsible party will be tasked to implement those portions of the BMP plan identified for the responsible party for MCAS Tustin and MCAS El Toro.

The permittees shall develop and implement a collection program for all banned OC pesticides and PCBs. This type of program has had demonstrated success in other geographic areas in collecting and disposing of banned pesticides. Residents and businesses in the watershed may have stored legacy pesticides that could be collected through such a program; if this is the case, this task would prevent future use and improper disposal of these banned pesticides.

Implementation of these requirements shall commence upon issuance of appropriate Water Code Section 13267 letters or approval of an appropriately revised MS4 permits, whichever occurs first. Revisions to the Orange County MS4 permit and Caltrans SWMP shall implement requirements specified in applicable Section 13267 letters, if used to implement TMDL-related requirements. The 13267 letters/revised permit shall specify require the permittees to: (a) submit a proposed plan and schedule for source analyses of MS4 tributary areas with elevated OCs concentrations within 3 months of issuance of the 13267 letters or permit revision; (b) implement the proposed plan upon approval by the Regional Board's Executive Officer; (c) submit a report within 6 months of completion of the approved study plan. The report shall provide the study results and include a proposed plan and schedule for prioritized implementation of BMPs in OCs source areas; (d) implement the BMP plan upon Executive Officer approval.

The permittees may address these requirements through their participation in the development and implementation of an appropriate, Regional Board approved Work Plan (Task 7).

Task 6: Evaluate Feasibility and Mechanisms to Fund Future Dredging Operations

Because large-scale erosion and sedimentation primarily occurs during large storm events, traditional BMPs may have limited success in reducing/eliminating the discharge of potentially-contaminated sediments to receiving waters during wet weather. In such cases, dredging within Newport Bay and/or San Diego Creek may be the most feasible and appropriate method of reducing OCs loads in these waters. However, the feasibility and effectiveness of dredging projects in removing OCs would require careful consideration, since dredging may or may not expose sediments with higher concentrations of OCs. Financing of such projects is also a significant consideration.

Entities discharging potentially contaminated sediment in the watershed shall analyze the feasibility of dredging to achieve water quality standards, and shall identify funding mechanisms for ensuring that future dredging operations can be performed, as necessary, within San Diego Creek, Upper and Lower Newport Bay. A report that presents the results of this effort shall be submitted no later than *(three years from the date of OAL approval of this BPA)*. It is recognized that dredging activities are likely to be an integral part of efforts to comply with other established TMDLs, particularly the sediment TMDL. Ideally, dredging feasibility and funding investigations would be integrated with implementation and review of the sediment TMDL through the comprehensive Work Plan (Task 7). The responsible parties may address this Task requirement through their participation in the development and implementation of an appropriate, Regional Board approved Work Plan.

Task 7: Develop a Comprehensive Work Plan to Meet TMDL Implementation Requirements, Consistent with the Adaptive Management Approach

During the development of these organochlorine compounds TMDLs, regulated stakeholders in the Newport Bay watershed expressed concerns that the numeric targets used to develop the TMDLs, wasteload allocations and load allocations were flawed and that scientific review by an independent panel of experts was necessary. Further, these stakeholders suggested that pollutants other than the organochlorine compounds, such as metals, pyrethrins or other, emerging pollutants may pose the more real or significant threat to beneficial uses in the watershed. Finally, it was recommended that an integrated approach to TMDL implementation, and to the development of pending TMDLs and refinement of established TMDLs, would be a more effective and efficient approach.

Substantial efforts are already being made by many stakeholders in the watershed to address established permit and/or TMDL requirements for BMP implementation and monitoring and to conduct special investigations to understand and improve water quality conditions in the watershed. Thus, the framework exists to develop a

comprehensive watershed plan for addressing water quality, not only as it relates to the organochlorine compounds, but on a larger scale that encompasses all sources of water quality impairment.

This implementation plan provides the opportunity for regulated stakeholders to form a Working Group and to participate in the development and implementation of a comprehensive Work Plan to evaluate the scientific basis of these organochlorine TMDLs, to prioritize TMDL implementation tasks, to integrate implementation with other TMDL and/or permit requirements, and to investigate unknown sources of toxicity in the watershed. As noted in the previous Task descriptions, participation by responsible parties in the Working Group and the development and implementation of a Regional Board Work Plan would address the responsible parties' obligations pursuant to the Tasks in Table NB-OCs-13. Dischargers who elect not to participate in the Working Group/Work Plan will be required to implement these Tasks, as described above.

Dischargers interested in participating in a Working Group to develop and implement a comprehensive Work Plan must commit to do so by *(within one month of OAL approval of the BPA)*. Submittal of a draft Work Plan is required no later than *(three months of OAL approval of the BPA)*. The schedules for implementation of the tasks identified in the Work Plan must reflect the shortest practicable time necessary to complete the tasks. Implementation of the Work Plan will commence upon approval of the Work Plan by the Regional Board at a properly noticed public hearing. Execution of the Work Plan must be complete within five years of Regional Board approval. Substantive changes to the tasks and schedules included in the approved Work Plan are contingent on Regional Board approval at a subsequent, properly noticed public hearing(s). However, the Regional Board's Executive Officer is authorized to revise the approved tasks and schedules if no significant comments are received during the public notice period.

At a minimum, the expected result of the execution of the Work Plan is a comprehensive, watershed plan for BMP implementation, monitoring, special investigations and other actions that will assure compliance with the OCs TMDLs, as they may be amended, as soon as possible after completion of execution of the Work Plan but no later than December 31, 2015³.

The specific detailed Work Plan tasks and schedules will be determined as the Work Plan is developed. Regional Board staff will work with the Working Group to identify a suitable Work Plan. Key initial tasks are expected to include the following:

1. Convene an Independent Advisory Panel (IAP) of experts with relevant expertise. To avoid questions of objectivity, the panel shall be convened by a neutral third party organization such as the National Water Research Institute. The Working Group and Regional Board staff will work together to define the desired qualifications needed for IAP participants, define the scope and

³ This compliance date is subject to change through the Basin Planning process.

authority of the IAP, and identify and describe the primary issues that will require guidance, recommendations, or specific actions from the IAP.

2. Re-evaluate OCs TMDLs Numeric Targets and Loads

With input and recommendations from the IAP, and using data being generated through ongoing scientific investigations in the watershed, the Work Plan should assess the current OCs TMDLs numeric targets, evaluate potential alternative numeric targets, and determine if the current targets should be revised, or whether targets based on site-specific data can be developed. If site-specific targets can be developed, the process or methods that will be used to develop targets should be determined, such as risk assessments or re-calculation of targets using accepted, peer-reviewed scientific methodologies.

It is recognized that there is a need for flexibility to respond to unanticipated findings and events, and to changes that may be recommended by the Independent Advisory Panel (see below). However, at a minimum, each of the Tasks identified in Table NB-OCs-13 (except Task 1, which requires action by the Regional Board, and Task 4, which requires action by the Regional Board and the MS4 permittees based on established MS4 permit requirements) must be considered in Work Plan development and implementation. If one or more of these tasks is not proposed for inclusion in the Work Plan, or where modifications of these tasks/schedules are recommended, a written description and justification must be provided with the draft Work Plan submittal. In addition, consideration shall be given to the following:

Develop conceptual models

Data interpretation and monitoring must be organized around a systematic conceptual view of the sources of the different organochlorine compounds and their distribution and behavior in the watershed. Development of conceptual models for these compounds would significantly enhance our understanding of their sources and impacts and would help to structure hypothesis development, monitoring design, and data interpretation. Development of the conceptual models should be based on a review of available data and information about the OCs in the watershed, and the models should be updated as new information accumulates. Characterization of sources and of habitats at risk should be based on a review of available data, framed in terms of the conceptual models and supported with the collection of new data as needed. It is expected that the IAP would provide critical review and recommendations in this process.

Develop Information Management System

Different types of data – water column, sediment, fish or bird egg tissue, infaunal surveys, hydrology, etc. – are being or will be collected throughout

the Newport Bay watershed through a variety of studies, monitoring programs, or other projects. Since these data are often collected for different purposes (e.g., in response to various TMDLs and/or permits), at different times and in different areas, much of the data may be in non-comparable formats, redundant, or not spatially or temporally compatible. In order to determine what data are useful or significant, where data gaps may still occur, or where current data needs are sufficient, a comprehensive information management system should be developed that (1) establishes clear procedures for assessing data quality for data acquisition and transfer and for control of evolving versions of datasets; (2) is a relational database that can manage the variety of data types and has appropriate mechanisms for ensuring and maintaining data quality; (3) can conduct quality control checks and needed reformatting to ensure needed consistency across all data types and sources as data from other sources are obtained; (4) provides for straightforward query and data sub-setting routines to streamline access to the data; and (5) ensures that GIS capability is available for analysis, modeling, and presentation purposes. Development of a comprehensive information management system will allow for the identification of significant data gaps that need to be addressed and will provide a vehicle for establishing monitoring guidelines and preventing redundant or superfluous data collection.

To the extent that there are any conflicts between the individual tasks and schedules identified in Table NB-OCs-13, and the prioritized plan and schedule identified in the Work Plan, the Work Plan would govern implementation activities with respect to the stakeholders responsible for Work Plan development and implementation as part of the Working Group.

Task 8: Revise Regional Monitoring Program

The County of Orange, as Principal Permittee under the County's MS4 permit, oversees the countywide monitoring program. Implementation of the monitoring program is supported by funds shared proportionally by each of the Permittees named in the Orange County MS4 permit. Some monitoring requirements identified in this implementation plan are already reflected in the current program.

By (3 months from OAL approval of BPA), the Orange County MS4 permittees shall: (1) document each of the current monitoring program elements that addresses the monitoring requirements identified in the preceding tasks; and, (2) revise the monitoring program as necessary to assure compliance with these monitoring requirements.

Review of/revisions to the monitoring program shall address:

- (1) Estimation of mass emissions of chlordane, DDT, PCBs and toxaphene.

- (2) Determination of compliance with MS4 wasteload allocations for Upper and Lower Newport Bay, and of status of achievement with the informational wasteload allocations for San Diego Creek for chlordane and PCBs.
- (3) Assessment of temporal and spatial trends in organochlorine compound concentrations in water, sediment and tissue samples.
- (4) Semi-annual sediment monitoring in San Diego Creek and Newport Bay. Measurements of sediment chemistry in these waters should be evaluated with respect to evidence of biological effects, such as toxicity and benthic community degradation.
- (5) Evaluation of organochlorine bioaccumulation and food web biomagnification
- (6) Assessment of the degree to which natural attenuation is occurring in the watershed.

Accurately quantifying the very small mass loads that are allowable under these TMDLs will be very challenging; analytical strategies for quantifying loads of the organochlorine compounds must be carefully explored.

Revisions to the monitoring program shall take into consideration the following recommendations provided by members of the Organochlorine Compounds TMDL Technical Advisory Committee (TAC):

- (1) The analytical parameters measured need to be established for each matrix of interest (e.g., sediment, tissue, ambient water). The representative list of compounds to be measured needs to be identified (e.g., what chlordane compounds will be measured and summed to represent "total chlordane;" will PCB congeners be measured and summed or will Aroclors?).
- (2) Data quality will need to be consistent with the State's Surface Water Ambient Monitoring Program (SWAMP). Detection limits, accuracy and precision of analytical methods should be adequate to assure the goals of the monitoring efforts can be achieved.
- (3) Bioaccumulation/biomagnification in high trophic level predators may not immediately respond to load reductions; appropriate time scales and schedules for monitoring that are supported by empirical data and/or modeling should be established.
- (4) Sentinel fish and wildlife species should be selected for monitoring based on home range, life history, size and age.

MS4 permittees may address the requirements specified herein by participation in the Working Group and development and implementation of an appropriate, Regional Board approved Work Plan (see Task 7).

Task 9: Conduct Special Studies

The following special studies should be conducted, in addition to the studies already underway in the watershed. This list is based, in part, on recommendations of the technical advisory committee for the organochlorine compounds TMDLs. These studies will be implemented as resources become available, and the results will be used to review and revise these TMDLs. Stakeholder contributions to these investigations are encouraged and would facilitate review of the TMDLs.

- (1) Evaluation of sediment toxicity in San Diego Creek and tributaries, and Upper and Lower Newport Bay.

Previous studies have included Toxicity Identification Evaluations (TIEs) that have yielded inconclusive results as to the cause of toxicity in Newport Bay. Sediment toxicity within San Diego Creek is not well-documented or well-understood. There is evidence that pyrethroid compounds may be a significant contributor. In determining the extent to which nonpolar organic compounds are causing or contributing to sediment toxicity, the differential contribution of both the organochlorine compounds and pyrethroids should be determined to assure that control actions are properly identified and implemented. Monitoring should be performed year-round at multiple locations within San Diego Creek and Newport Bay (to encompass spatial and temporal variability), and should include various land use types in order to quantify the relative contributions from various sources.

- (2) Refinement of sediment and tissue targets.

A study is being conducted by the San Francisco Estuary Institute to develop indicators and a framework for assessing the indirect effects of sediment contaminants. The objective is to provide methodology that will assist in evaluating indirect adverse biological effects for bioaccumulative pollutants (e.g. due to food web biomagnification), as part of the overall goal of developing statewide sediment quality objectives. Newport Bay is being used as a case study to show how the proposed methodology could be implemented on a screening level. Multiple lines of evidence will be evaluated to determine impacts of organochlorine pesticides and PCBs to humans and wildlife. A conceptual foodweb model will be developed, and sensitive wildlife receptors will be identified. Empirical field data and a steady-state food web model will be used to calculate bioaccumulation factors for the organochlorine compounds. The bioaccumulation factors will be combined with effects thresholds to identify sediment concentrations that are protective of target wildlife and humans.

Once completed by SFEI, a thorough evaluation of the Newport Bay case study needs to be initiated, and any additional analyses required for a more in-depth risk analysis should be identified and completed. Protective sediment and tissue targets for indirect effects to humans and wildlife should be developed by the time the TMDLs are re-opened. Furthermore, once TIEs have identified the likely toxicant(s)

responsible for sediment toxicity in San Diego Creek and Newport Bay (direct effects), field and laboratory studies should be conducted in order to determine bioavailability and the dose-response relationship between sediment concentrations and biologic effects.

- (3) Evaluation of regional BMPs (e.g., constructed wetlands and sediment detention basins) for mitigating potential adverse water quality impacts of sediment-associated pollutants (e.g., OCs, pyrethroids).

Large-scale, centralized BMPs such as constructed wetlands and storm water retention basins may be more effective than project-level BMPs in reducing adverse environmental impacts of sediment-borne pollutants. Regional BMPs are either being planned or are in place within the watershed (e.g., IRWD NTS). Their potential effectiveness for capturing the organochlorine compounds and mitigating impacts needs to be evaluated.

- (4) Improvement in linkage between toxaphene measured in fish tissue and toxaphene in bed sediments.

The toxaphene impairment listing for San Diego Creek is based on fish tissue exceedances that have no measured linkage with toxaphene in sediments. While sediment is the primary TMDL target for these TMDLs, toxaphene is usually not detected in sediment. Because of its chemical complexity, there is a large degree of analytical uncertainty with measurements of toxaphene in environmental samples that use standard methods (e.g., EPA Method 8081a), especially at low levels. Confirmations of toxaphene in fish and sediment samples in San Diego Creek (and possibly Newport Bay) using other techniques (e.g., GC-ECNI-MS or MS/MS) is recommended.

- (5) Evaluation of relative importance of continuing OCs discharges to receiving waters through erosion and sedimentation processes, versus recirculation of existing contaminated bed sediments, in causing beneficial use impairment in San Diego Creek and Newport Bay.

This study should allow for determination of the most effective implementation strategies to reduce organochlorine compounds in the MS4 and other receiving waters.

Phase II Implementation

Task 10: TMDL Reopener

These TMDLs will be reopened no later than *(five (5) years following OAL approval of this BPA)* in order to evaluate the effectiveness of Phase I implementation. At that time, all new data will be evaluated and used to reassess impairment, BMP

effectiveness, and whether modifications to the TMDLs are warranted. If BMPs implemented during Phase I have been shown to be ineffective in reducing levels of organochlorine compounds, then more stringent BMPs may be necessary during Phase II implementation.

Implementation of these TMDLs and the schedule for implementation are very closely tied with other TMDLs that are currently being implemented in the watershed. The sediment TMDL allowable load for San Diego Creek was the basis for calculating organochlorine compound loading capacities. The sediment TMDL is scheduled for revision in 2007; changes to the sediment TMDLs will likely necessitate changes to these organochlorine compounds TMDLs as well.



Attachment A

Revised OCs TMDLs Basin Plan Amendment

(Revisions to amendment proposed on April 20, 2007)

Note: Additions are underlined; deletions are shown in strike-out type

(NOTE: The language identified below is proposed to be inserted into Chapter 5 of the Basin Plan. If the amendment is approved, corresponding changes will be made to the Table of Contents, the List of Tables, page numbers, and page headers in the plan. Due to the two-column page layout of the Basin Plan, the location of tables in relation to text may change during final formatting of the amendment. In order to accommodate other new TMDLs adopted as Basin Plan amendments and to maintain their order by watershed, the table and figure identifiers may be modified in future formatting of the Basin Plan for re-publication purposes. However, no substantive changes to the tables/figures would occur absent a Basin Plan Amendment.)

Chapter 5 - Implementation Plan, Discussion of Newport Bay Watershed (page 5-39 et seq), add the following to 4. Toxic Substances Contamination

4.b Organochlorine Compounds TMDLs

Organochlorine compounds, including DDT, PCBs, toxaphene and chlordane, possess unique physical and chemical properties that influence their persistence, fate and transport in the environment. While these characteristics vary among the organochlorine compounds, they all exhibit an ability to resist degradation, partition into sediment, and to accumulate in the tissue of organisms, including invertebrates, fish, birds and mammals. The bioaccumulation of these compounds can adversely affect the health and reproductive success of aquatic organisms and their predators, and can pose a health threat to human consumers.

A TMDL technical report prepared by Regional Board staff [Ref. # 1] describes organochlorine-related problems in Newport Bay and its watershed and delineates the technical basis for the TMDLs that follow.

The waterbody-pollutant combinations for which organochlorine compounds TMDLs were established by the Regional Board are listed in Table NB-OCs-1. These TMDLs differ from those established by USEPA in 2002 in several respects:

First, based on an updated impairment assessment that utilized new data and applied the State Water Board's "Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List" (2004) [Ref. # 2], the Regional Board established TMDLs for a list of organochlorine compound-waterbody

combinations different from that of USEPA. As shown in Table NB-OCs-2, USEPA also established TMDLs for dieldrin, chlordane, and PCBs in San Diego Creek and for dieldrin in Lower Newport Bay. In contrast, the Regional Board found no impairment as the result of dieldrin in any of these waters, nor was impairment due to chlordane or PCBs found in San Diego Creek and its tributaries.

As described in the TMDL technical report, Regional Board staff also found no impairment due to DDT in San Diego Creek or its tributaries. However, in adopting the 2006 Section 303(d) list (October 25, 2006, Resolution No. 2006-0079), the State Water Board found impairment due to DDT in Peter's Canyon Channel. In response, the Regional Board established a TMDL for DDT in San Diego Creek and its tributaries, including Peters Canyon Channel.

Second, corrections and modifications were made to loading capacities and existing loads identified in USEPA's TMDLs. Finally, an implementation plan is specified (see Section 4.b.3).

While the Regional Board did not establish TMDLs for chlordane and PCBs for San Diego Creek and tributaries, the Board did develop informational TMDLs for these substances in these waters, pursuant to Clean Water Act Section 303(d)(3). These informational TMDLs are shown in Table NB-OCs-3. This action was taken in light of several factors. First, the largest source of organochlorine compounds to Newport Bay is San Diego Creek. Second, the data suggest that the existing loading of chlordane to the Creek is greater than the loading capacity. This suggests that the lack of finding of impairment due to chlordane may be simply a reflection of a lack of data with which to assess impairment. Finally, these informational TMDLs may forward action to address organochlorine compound problems in the watershed. These informational TMDLs have no regulatory effect but may be used as the basis for further investigation of the relative contributions of the various sources of organochlorine compound inputs to San Diego Creek and thence the Bay. In the long-term, this would be expected to help assure proper apportionment of responsibility for implementation of the TMDLs identified in Table NB-OCs-1.

Table NB-OCs-1. Waterbody-pollutant combinations for which Organochlorine Compound TMDLs are established

Waterbody	Pollutant
San Diego Creek and tributaries	DDT, Toxaphene
Upper Newport Bay	Chlordane, DDT, PCBs
Lower Newport Bay	Chlordane, DDT, PCBs

Table NB-OCs-2. Waterbody-pollutant combinations for which Organochlorine Compounds TMDLs were established by USEPA (2002) and Regional Board (2007)

Waterbody	TMDLs	
	USEPA	Regional Board
San Diego Creek and tributaries*	Chlordane, dieldrin, DDT, PCBs, Toxaphene	DDT, Toxaphene
Upper Newport Bay	Chlordane, DDT, PCBs	Chlordane, DDT, PCBs
Lower Newport Bay	Chlordane, dieldrin, DDT, PCBs	Chlordane, DDT, PCBs

*TMDLs are established for San Diego Creek and tributaries, even if impairment was only found in particular reaches (e.g., SWRCB found DDT impairment in Peter's Canyon Channel, a primary tributary to San Diego Creek Reach 1, but the TMDL includes all of San Diego Creek and tributaries).

Table NB-OCs-3. Informational TMDLs

Waterbody	Informational TMDLs
San Diego Creek and tributaries	Chlordane, PCBs

4.b.1 Numeric Targets used in Organochlorine Compounds TMDLs

Numeric targets identify specific endpoints in sediment, water column or tissue that equate to attainment of water quality standards, which is the purpose of TMDLs. Multiple targets may be appropriate where a single indicator is insufficient to protect all beneficial uses and/or attain all applicable water quality objectives. The range of beneficial uses identified in this Basin Plan (see Chapter 3) for the waters addressed by the organochlorine compounds TMDLs makes clear that the targets must address the protection of aquatic organisms, wildlife (including federally listed threatened and endangered species) and human consumers of recreationally and commercially caught fish.

Sediment, water column and fish tissue targets are identified for these TMDLs, as shown in Table NB-OCs-4. The sediment and water column targets are identical to those selected by USEPA in the development of their organochlorine compounds TMDLs (2002). Fish tissue targets are added for the protection of aquatic life and wildlife.

The targets employed in the development of informational TMDLs for chlordane and PCBs in San Diego Creek and its tributaries are shown in Table NB-OCs-5.

Table NB-OCs-4. Numeric Sediment, Fish Tissue, and Water Column TMDL Targets

	Total DDT	Chlordane	Total PCBs	Toxaphene
Sediment Targets¹; units are µg/kg dry weight				
San Diego Creek and tributaries	6.98			0.1
Upper & Lower Newport Bay	3.89	2.26	21.5	
Fish Tissue Targets for Protection of Human Health²; units are µg/kg wet weight				
San Diego Creek and tributaries	100			30
Upper & Lower Newport Bay	100	30	20	
Fish Tissue Targets for Protection of Aquatic Life and Wildlife³; units are µg/kg wet weight				
San Diego Creek and tributaries	1000			100
Upper & Lower Newport Bay	50	50	500	
Water Column Targets for Protection of Aquatic Life, Wildlife & Human Health⁴ (µg/L)				
San Diego Creek and tributaries				
Acute Criterion (CMC)	1.1			0.73
Chronic Criterion (CCC)	0.001			0.0002
Human Health Criterion	0.00059			0.00075
Upper & Lower Newport Bay				
Acute Criterion (CMC)	0.13	0.09		
Chronic Criterion (CCC)	0.001	0.004	0.03	
Human Health Criterion	0.00059	0.00059	0.00017	

¹Freshwater and marine sediment targets, except toxaphene, are TELs from Buchman, M.F. 1999. NOAA Screening Quick Reference Tables, NOAA HAZMAT Report 99-1, Seattle WA, Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration, 12 pp. Toxaphene target is from N.Y. Dept. of Environmental Conservation.

²Freshwater and marine fish tissue targets for protection of human health are OEHHA SVs.

³Freshwater and marine fish tissue targets for protection of aquatic life and wildlife are from Water Quality Criteria 1972. A report of the Committee on Water Quality Criteria, Environmental Studies Board, National Academy of Sciences, National Academy of Engineering. Washington, D.C., 1972.

⁴Freshwater and marine targets are from California Toxics Rule (2000).

Table NB-OCs-5. Numeric Sediment, Fish Tissue, and Water Column Targets used in Informational TMDLs

	Chlordane	Total PCBs
Sediment Targets¹; units are µg/kg dry weight		
San Diego Creek and tributaries	4.5	34.1
Fish Tissue Targets for Protection of Human Health²; units are µg/kg wet weight		
San Diego Creek and tributaries	30	20
Fish Tissue Targets for Protection of Aquatic Life and Wildlife³; units are µg/kg wet weight		
San Diego Creek and tributaries	100	500
Water Column Targets for Protection of Aquatic Life, Wildlife & Human Health⁴ (µg/L)		
San Diego Creek and tributaries		
<i>Acute Criterion (CMC)</i>	2.4	
<i>Chronic Criterion (CCC)</i>	0.0043	0.014
<i>Human Health Criterion</i>	0.00059	0.00017

¹Freshwater sediment targets are TELs from Buchman, M.F. 1999. NOAA Screening Quick Reference Tables, NOAA HAZMAT Report 99-1, Seattle WA, Coastal Protection and Restoration Division, National Oceanic and Atmospheric Administration, 12 pp.

²Freshwater fish tissue targets for protection of human health are OEHHA SVs.

³Freshwater fish tissue targets for protection of aquatic life and wildlife are from Water Quality Criteria 1972. A report of the Committee on Water Quality Criteria, Environmental Studies Board, National Academy of Sciences, National Academy of Engineering. Washington, D.C., 1972.

⁴Freshwater targets are from California Toxics Rule (2000).

The linkage between adverse effects in sensitive wildlife species and concentrations of the organochlorine pollutants in sediments, prey organisms and water is not well understood at the present time, although work is underway to better understand ecological risk in Newport Bay. In addition, the State is in the process of developing sediment quality objectives that should provide guidance for assessing adverse effects due to pollutant bioaccumulation. Reducing contaminant loads in the sediment will result in progress toward reducing risk to aquatic life and wildlife. During implementation of these TMDLs, additional and/or modified wildlife or other targets will be identified as risk assessment information becomes available. These TMDLs will be revisited (see 4.b.3) and revised as appropriate.

4.b.2. Organochlorine Compounds TMDLs, Wasteload Allocations, Load Allocations and Compliance Dates

The organochlorine compounds TMDLs for San Diego Creek and its tributaries, Upper Newport Bay and Lower Newport Bay are shown in Tables NB-OCs-6 and NB-OCs-7. The TMDLs are expressed on a daily basis (average grams per day) in Table NB-OCs-6, and on an annual basis (grams per year) in Table NB-OCs-7. Expression of the TMDLs on a daily basis is intended to comply with a relevant court decision. However, because of the strong seasonality associated with the loading of organochlorine compounds during storm events, it is appropriate for implementation to occur based on average annual loadings. The TMDLs are to be achieved as soon as possible but no later than December 31, 2015.

Table NB-OCs-6. TMDLs for San Diego Creek, Upper and Lower Newport Bay (expressed on a "daily" basis to be consistent with the D.C. Circuit Court of Appeals decision in *Friends of the Earth, Inc. v. EPA, et al.*, No. 05-5015 [D.C. Cir.2006]).

Water Body	Pollutant	TMDL (average grams per day)^a
San Diego Creek and Tributaries	Total DDT	1.08
	Toxaphene	0.02
Upper Newport Bay	Total DDT	0.44
	Chlordane	0.25
	Total PCBs	0.25
Lower Newport Bay	Total DDT	0.16
	Chlordane	0.09
	Total PCBs	0.66

^a Compliance to be achieved as soon as possible but no later than December 31, 2015.

Table NB-OCs-7. TMDLs for San Diego Creek, Upper and Lower Newport Bay (expressed on annual basis for implementation purposes)

Water Body	Pollutant	TMDL (grams per year) ^a
San Diego Creek and Tributaries	Total DDT	396
	Toxaphene	6
Upper Newport Bay	Total DDT	160
	Chlordane	93
	Total PCBs	92
Lower Newport Bay	Total DDT	59
	Chlordane	34
	Total PCBs	241

^a Compliance to be achieved as soon as possible but no later than December 31, 2015.

Informational TMDLs for San Diego Creek and its tributaries for chlordane and total PCBs are shown in Table NB-OCs-8. Again, these informational TMDLs are expressed on an average daily and annual basis.

Table NB-OCs-8. Informational TMDLs for San Diego Creek and Tributaries (expressed on average daily and annual bases)

Water Body	Pollutant	TMDL (average grams per day)
San Diego Creek and Tributaries	Chlordane	0.70
	Total PCBs	0.34
		TMDL (grams per year)
San Diego Creek and Tributaries	Chlordane	255
	Total PCBs	125

Wasteload and load allocations to achieve the TMDLs specified in Tables NB-OCs-6 and NB-OCs-7 are shown in Tables NB-OCs-9 and NB-OCs-10, respectively. Like the TMDLs, the allocations are expressed in terms of both average daily and annual loads. An explicit margin of safety (MOS) of ten percent was applied in calculating the allocations. Consistent with the TMDL compliance schedule, these allocations are to be achieved as soon as possible but no later than December 31, 2015.

Wasteload and load allocations necessary to meet the informational TMDLs shown in Table NB-OCs-8 are identified in Tables NB-OCs-11 (expressed as average daily loads) and NB-OCs-12 (expressed as annual loads). These allocations are identified only for informational purposes.

4.b.3. Implementation of Organochlorine Compounds TMDLs

These TMDLs are to be implemented within an adaptive management framework, with compliance monitoring, special studies, and stakeholder interaction guiding the process over time. Information obtained from compliance monitoring will measure progress toward achievement of WLAs and LAs, potentially leading to changes to TMDL allocations; ongoing investigations and recommended special studies, if implemented, may provide information that leads to revisions of the TMDLs, adjustments to the implementation schedule, and/or improved implementation strategies. Thus, implementation of the TMDLs is expected to be an ongoing and dynamic process.

The implementation plan identified in this section reflects the adaptive management, phased approach to the organochlorine compound TMDLs adopted by the Regional Board. The Board found a phased approach, with compliance schedules, appropriate in light of the following considerations. First, it was recognized that additional monitoring and special studies were either already underway or would be needed to address data limitations and significant uncertainty associated with the TMDL calculations, and that changes to the TMDLs might be appropriate based on the results of those investigations. Second, it was also understood that these data limitations and uncertainties pertained to the impairment assessment itself and the determination of the specific organochlorine compounds for which TMDLs are required. Third, the natural attenuation of these compounds over time is expected to affect significantly the selection, development and implementation of TMDLs. As described in the TMDL technical report [Ref.1], use of the organochlorine compounds addressed by these TMDLs has been banned for many years and trend analyses indicate declining concentrations of these substances in fish tissue over time. Natural attenuation should eventually reduce organochlorine pollutant levels to concentrations that pose no threat to beneficial uses in San Diego Creek or Newport Bay. While natural degradation of these compounds is likely the principal cause of the observed decline in fish tissue concentrations, the implementation of erosion and sediment controls and other Best Management Practices to address compliance with the sediment and nutrient TMDLs for Newport Bay and its watershed (see

Table NB-OCs-9. TMDLs and Allocations for San Diego Creek, Upper and Lower Newport Bay (expressed on a "daily" basis to be consistent with the recent D.C. Circuit Court of Appeals decision in Friends of the Earth, Inc. v. EPA, et al., No. 05-5015 [D.C. Cir.2006]).^{a,b}

		Total DDT	Chlordane	Total PCBs	Toxaphene
Type		(average grams/day)			
San Diego Creek					
WLA	Urban Runoff – County MS4 (36%)	0.35			0.005
	Construction (28%)	0.27			0.004
	Commercial Nurseries (4%)	0.04			0.001
	Caltrans MS4 (11%)	0.11			0.002
	Subtotal – WLA (79%)	0.77			0.01
LA	Agriculture (5%) (excludes nurseries under WDRs)	0.05			0.001
	Open Space (9%)	0.09			0.001
	Streams & Channels (2%)	0.02			0.0003
	Undefined (5%)	0.05			0.001
	Subtotal – LA (21%)	0.21			0.003
MOS (10% of total TMDL)		0.11			0.002
Total TMDL		1.08			0.02
Upper Newport Bay					
WLA	Urban Runoff - County MS4 (36%)	0.14	0.08	0.08	
	Construction (28%)	0.11	0.06	0.06	
	Commercial Nurseries (4%)	0.02	0.01	0.01	
	Caltrans MS4 (11%)	0.04	0.03	0.02	
	Subtotal – WLA (79%)	0.31	0.18	0.18	
LA	Agriculture (5%) (excludes nurseries under WDRs)	0.02	0.01	0.01	
	Open Space (9%)	0.04	0.02	0.02	
	Streams & Channels (2%)	0.01	0.005	0.005	
	Undefined (5%)	0.02	0.01	0.01	
	Subtotal – LA (21%)	0.08	0.05	0.05	
MOS (10% of Total TMDL)		0.04	0.03	0.03	
Total TMDL		0.44	0.25	0.25	
Lower Newport Bay					
WLA	Urban Runoff – County MS4 (36%)	0.05	0.03	0.21	
	Construction (28%)	0.04	0.02	0.17	
	Commercial Nurseries (4%)	0.01	0.003	0.02	
	Caltrans MS4 (11%)	0.02	0.01	0.07	
	Subtotal – WLA (79%)	0.11	0.07	0.47	
LA	Agriculture (5%) (excludes nurseries under WDRs)	0.01	0.004	0.03	
	Open Space (9%)	0.01	0.01	0.05	
	Streams & Channels (2%)	0.003	0.002	0.01	
	Undefined (5%)	0.01	0.004	0.03	
	Subtotal – LA (21%)	0.03	0.02	0.12	
MOS (10% of Total TMDL)		0.02	0.01	0.07	
Total TMDL		0.16	0.09	0.66	

^a Percentages for WLA (79%) and LA (21%) are applied to the TMDL, after subtracting the 10% MOS from the Total TMDL. Percent WLA and Percent LA add to 100%.

^b Compliance to be achieved as soon as possible but no later than December 31, 2015.

Table NB-OCs-10. TMDLs and Allocations (Annual) for San Diego Creek, Upper and Lower Newport Bay (expressed on an "annual" basis for implementation purposes).^a

		Total DDT	Chlordane	Total PCBs	Toxaphene
	Type	(grams per year)			
San Diego Creek					
WLA	Urban Runoff – County MS4 (36%)	128.3			1.9
	Construction (28%)	99.8			1.5
	Commercial Nurseries (4%)	14.3			0.2
	Caltrans MS4 (11%)	39.2			0.6
	Subtotal – WLA (79%)	281.6			4.3
LA	Agriculture (5%) (excludes nurseries under WDRs)	17.8			0.3
	Open Space (9%)	32.1			0.5
	Streams & Channels (2%)	7.1			0.1
	Undefined (5%)	17.8			0.3
	Subtotal – LA (21%)	74.8			1.1
MOS (10% of Total TMDL)		40			0.6
Total TMDL		396			6
Upper Newport Bay					
WLA	Urban Runoff – County MS4 (36%)	51.8	30.1	29.8	
	Construction (28%)	40.3	23.4	23.2	
	Commercial Nurseries (4%)	5.8	3.3	3.3	
	Caltrans MS4 (11%)	15.8	9.2	9.1	
	Subtotal – WLA (79%)	113.8	66.1	65.4	
LA	Agriculture (5%) (excludes nurseries under WDRs)	7.2	8	7	
	Open Space (9%)	13.0	7.6	7.5	
	Streams & Channels (2%)	2.9	1.7	1.7	
	Undefined (5%)	7.2	4.2	4.2	
	Subtotal – LA (21%)	30.2	21.4	20.3	
MOS (10% of Total TMDL)		16	9	9	
Total TMDL		160	93	92	
Lower Newport Bay					
WLA	Urban Runoff – County MS4 (36%)	19.1	11.0	78.1	
	Construction (28%)	14.9	8.6	60.7	
	Commercial Nurseries (4%)	2.1	1.2	8.7	
	Caltrans MS4 (11%)	5.8	3.4	23.9	
	Subtotal – WLA (79%)	41.9	24.2	171.4	
LA	Agriculture (5%) (excludes nurseries under WDRs)	2.7	1.5	10.8	
	Open Space (9%)	4.8	2.8	19.5	
	Streams & Channels (2%)	1.1	0.6	4.3	
	Undefined (5%)	2.7	1.5	10.8	
	Subtotal – LA (21%)	11.2	6.4	45.5	
MOS (10% of Total TMDL)		5.9	3.4	24	
Total TMDL		59	34	241	

^a Percentages for WLA (79%) and LA (21%) are applied to the TMDL, after subtracting the 10% MOS from the total TMDL. Percent WLA and Percent LA add to 100%.

^b Compliance to be achieved as soon as possible but no later than December 31, 2015.

Table NB-OCs-11. Informational TMDLs and Allocations for San Diego Creek (expressed on a “daily” basis).^a

Category	Type	Chlordane	Total PCBs
		(average grams per day)	
San Diego Creek			
WLA	Urban Runoff – County MS4 (36%)	0.23	0.11
	Construction (28%)	0.18	0.09
	Commercial Nurseries (4%)	0.03	0.01
	Caltrans MS4 (11%)	0.07	0.03
	Subtotal – WLA (79%)	0.50	0.24
LA	Agriculture (5%) (excludes nurseries under WDRs)	0.03	0.02
	Open Space (9%)	0.06	0.03
	Streams &Channels (2%)	0.01	0.01
	Undefined (5%)	0.03	0.02
	Subtotal – LA (21%)	0.13	0.08
MOS (10% of total TMDL)		0.07	0.03
Total TMDL		0.70	0.34

^a Percentages for WLA (79%) and LA (21%) are applied to the TMDL, after subtracting the 10% MOS from the Total TMDL.. Percent WLA and Percent LA add to 100%.

Table NB-OCs-12. Informational TMDLs and Allocations (Annual) for San Diego Creek (expressed on an “annual” basis)^a –

Category	Type	Chlordane	Total PCBs
		(grams per year)	
San Diego Creek			
WLA	Urban Runoff – County MS4 (36%)	82.6	40.5
	Construction (28%)	64.3	31.5
	Commercial Nurseries (4%)	9.2	4.5
	Caltrans MS4 (11%)	25.2	12.4
	Subtotal – WLA (79%)	181.3	88.9
LA	Agriculture (5%) (excludes nurseries under WDRs)	11.5	5.6
	Open Space (9%)	20.7	10.1
	Streams &Channels (2%)	4.6	2.3
	Undefined (5%)	11.5	5.6
	Subtotal – LA (21%)	48.2	23.6
MOS (10% of total TMDL)		26	13
Total TMDL		255	125

^a Percentages for WLA (79%) and LA (21%) are applied to the TMDL, after subtracting the 10% MOS from the total TMDL. Percent WLA and Percent LA add to 100%.

discussions of these TMDLs elsewhere in this Basin Plan) is a probable factor. In any case, the observed trends suggest that as monitoring continues in the watershed and pollutant levels decline, some or all of the organochlorine compounds may warrant delisting from the Clean Water Act Section 303(d) list of impaired waters. Again, these TMDLs would need to be revisited accordingly.

This implementation plan also reflects recommendations by regulated stakeholders in the Newport Bay watershed to convene a Working Group to develop and implement a comprehensive Work Plan to: address, as an early action item, the technical uncertainties in these TMDLs and make recommendations for revisions, as appropriate; identify and prioritize tasks necessary to implement the TMDLs; integrate TMDL implementation tasks with those already being conducted in response to other programs (e.g., permits, other TMDLs); and, investigate other pollutants of concern in the watershed.

Table NB-OCs-13 lists the tasks and schedules needed to implement the organochlorine TMDLs. This Implementation Plan is aimed at identifying actions to accelerate the decline in organochlorine compound concentrations in the watershed, and to augment their natural attenuation. The implementation plan is focused to a large extent on the monitoring and, where necessary, enhanced implementation of Best Management Practices (BMPs) to reduce the erosion and transport to surface waters of fine sediment to which the organochlorine compounds tend to adhere. Many of these BMPs are already in place as the result of existing permits issued by the Regional Board or State Water Resources Control Board for stormwater and construction activities, and/or in

response to established TMDLs. The intent is to assure that source control activities are implemented to reduce any active sources of the organochlorine compounds, and in other areas where such actions will be most effective in meeting the TMDL goals. Monitoring and special study requirements are included to provide for TMDL compliance assessment and refinement.

In response to the recommendation by watershed stakeholders, this implementation plan provides an opportunity for dischargers to participate in the development and implementation of a comprehensive Work Plan. ~~It is expected that the~~ implementation tasks identified in Table NB-OCs-13 (except Tasks 1 and 4; see discussion of Task 7, below) will be considered in the development of the Work Plan and incorporated, as appropriate. Implementation of the Work Plan, which will be approved by the Regional Board at a public hearing, will obviate the need for individual actions on the tasks in Table NB-OCs-13 by members of the Working Group. Completion of the Work Plan will result, in part, in recommendations for revisions to these TMDLs based on review by an Independent Advisory Panel and the results of ongoing or requisite monitoring and investigations, and in the development of a comprehensive plan for BMPs and other actions needed to assure compliance with the TMDLs, wasteload allocations and load allocations as soon as possible after completion of execution of the Work Plan but no later than December 31, 2015¹. Dischargers who elect not to participate in the Work Plan approach will be required to implement the tasks shown in Table NB-OCs-13, as appropriate.

Each of the tasks identified in Table NB-OCs-13 is described below.

¹ This compliance schedule and/or the organochlorine compounds TMDLs may be modified, through the Basin Planning process, in response to information provided by implementation of the Work Plan tasks and/or other investigations.

Table NB-OCs-13. Organochlorine Compounds TMDLs Implementation Tasks and Schedule

Task	Description	Compliance Date – As Soon As Possible But No Later Than ^b
PHASE I IMPLEMENTATION		
1	Revise existing WDRs and NPDES permits: <i>Commercial Nursery WDRs, MS4 Permit, Other NPDES Permits</i>	Upon OAL approval of BPA and permit renewal
2 ^a	a. Develop proposed agricultural BMP and monitoring program to assess and control OCs discharges. b. Implement program	a. (3 months after OAL approval of BPA) b. Upon Regional Board approval
3 ^a	a. Identify responsible parties for open space areas b. Develop proposed monitoring program to assess OCs inputs from open space areas c. Implement proposed monitoring program d. Develop plan to implement effective erosion and sediment control BMPs for management of fine particulates (if found necessary based on monitoring results) e. Implement BMP plan	a. (1 month after OAL approval of BPA) b. 2 months after notification of responsible parties c. Upon Regional Board approval d. Within 6 months of notification of need to develop plan e. Upon Regional Board approval
4 ^a	Implement effective sediment and erosion control BMPs for management of fine particulates on construction sites: Regional Board: a. Develop SWPPP Improvement Program b. Conduct outreach/training programs MS4 permittees: c. b. Revise planning processes as necessary to assure proper communication of SWPPP requirements d. c. Evaluate/implement BMPs effective in reducing/eliminating organochlorine discharges: i. Submit proposed plan and schedule for BMP studies and implement plan ii. Submit studies report; including plan and schedule to implement BMPs/include in Guidance Manual iii. Implement BMPs/include in Guidance Manual	a. (Upon OAL approval of BPA) b. (Two months of OAL approval of BPA) c. i. Within 3 months of appropriate revision of the MS4 permit d. i. Submit plan within 3 months of 13267 letter issuance/MS4 permit revision and implement upon Executive Officer approval; ii. Within 6 months of completion of studies plan; iii. Upon Executive Officer approval
	Evaluate sources of OCs; develop and implement	a. Submit plan within 3 months of

5 ^a	BMPs accordingly: a. Submit proposed plan and schedule for source area investigations b. Implement investigation plan c. Submit report of investigation findings and plan/schedule for implementation of BMPs d. Implement BMP plan	13267 letter issuance/appropriate revision of the MS4 permit b. Upon Executive Officer approval c. Within 6 months of completion of investigation plan d.- Upon Executive Officer approval
6 ^a	Evaluate feasibility and mechanisms to fund future dredging operations within San Diego Creek, Upper and Lower Newport Bay	Submit feasibility/funding report within <i>(3 years after OAL approval of BPA)</i>
7	Develop comprehensive Work Plan to meet TMDL implementation requirements, consistent with an adaptive management approach a. Convene Working Group b. Submit proposed Work Plan c. Implement Work Plan d. Complete execution of Work Plan	a. <i>(one month of OAL approval of BPA)</i> b. <i>(3 months after OAL approval of BPA)</i> c. Upon Regional Board approval d. Within 5 years of Work Plan approval
8 ^a	Revise regional monitoring program	<i>(3 months after OAL approval of BPA)</i> ; Annual Reports due November 15
9	Conduct special studies	As funding allows, and in order of priority identified in comprehensive Work Plan (Task 7), if applicable
PHASE II IMPLEMENTATION		
10	Review TMDLs, including numeric targets, WLAs and LAs; delist or revise TMDLs pursuant to established Sediment Quality Objectives, new data, and results of special studies	No later than <i>(5 years from OAL approval of BPA)</i>

a. The tasks and schedules identified in the Regional Board approved Work Plan developed by the Working Group shall govern implementation activities by members of the Working Group.

b. Final compliance with the TMDLs to be achieved no later than December 31, 2015.

Table NB-OCs-14. Existing NPDES Permits and WDRs Regulating Discharges in the Newport Bay Watershed

No.	Permit Title	Order No.	NPDES No.
1	Waste Discharge Requirements for the United States Department of the Navy, Former Marine Corps Air Station Tustin, Discharge to Peters Canyon Wash in the San Diego Creek/Newport Bay Watershed	R8-2006-0017	CA8000404
2	Waste Discharge Requirements for the County of Orange, Orange County Flood Control District and the Incorporated Cities of Orange County within the Santa Ana Region - Areawide Urban Storm Water Runoff - Orange County (MS4 permit)	R8-2002-0010	CAS618030
3	National Pollutant Discharge Elimination System (NPDES) Permit Statewide Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans)	99-06-DWQ	CAS000003
34	General Waste Discharge Requirements for Discharges to Surface Waters that Pose an Insignificant (de minimus) Threat to Water Quality	R8-2003-0061 as amended by R8-2005-0041 and R8-2006-0004	CAG998001
45	General Waste Discharge Requirements for Short-term Groundwater-Related Dischargers and De Minimus Wastewater Discharges to Surface Waters Within the San Diego Creek/Newport Bay Watershed	R8-2004-0021	CAG998002
53	General Groundwater Cleanup Permit for Discharges to Surface Waters of Extracted and Treated Groundwater Resulting from the Cleanup of Groundwater Polluted by Petroleum Hydrocarbons, Solvents and/or Petroleum Hydrocarbons mixed with Lead and/or Solvents	R8-2002-0007, as amended by R8-2003-0085 and R8-2005-0110	CAG918001
67	Waste Discharge Requirements for City of Tustin's 17th Street Desalter	R8-2002-0005	CA8000305
78	Waste Discharge Requirements for City of Irvine, Groundwater Dewatering Facilities, Irvine, Orange County,	R8-2005-0079	CA8000406
89	Waste Discharge Requirements for Bordiers Nursery, Inc.	R8-2003-0028	
910	Waste Discharge Requirements Hines Nurseries, Inc.	R8-2004-0060	
1011	Waste Discharge Requirements for El Modeno Gardens, Inc., Orange County	R8-2005-0009	

1112	Waste Discharge Requirements for Nakase Bros. Wholesale Nursery, Orange County	R8-2005-0006	
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Phase I Implementation

Task 1: WDRs and NPDES Permits

The Regional Board shall review and revise, as necessary, existing NPDES permits and/or WDRs to incorporate the appropriate TMDL WLAs, compliance schedules, and monitoring program requirements. These permits are identified in Table NB-OCs-14. The appropriate TMDL WLAs, compliance schedules and monitoring program requirements shall be included in new NPDES permits/WDRs. The NPDES permits/WDRs shall specify TMDL-related provisions that apply provided that: (1) the dischargers are and remain members of the Working Group (see Task 7); and (2) the approved Work Plan developed by the Working Group is implemented in a timely and effective manner. The NPDES permit/WDRs shall also include TMDL-related provisions that apply if the discharger(s) do not participate or discontinue participation in the Working Group and/or if the approved Work Plan is not implemented effectively or in a timely manner.

Compliance with the TMDLs and wasteload allocations is to be achieved as soon as possible, but no later than December 31, 2015. ~~For Working Group participants, NPDES permits/WDRs will specify that compliance with the wasteload allocations will not be required prior to the five year completion of execution of the Work Plan. NPDES permits/WDRs issued to Working Group members subsequent to the completion of execution of the Work Plan will require compliance with wasteload allocations as soon as possible but no later than December 31, 2015. For non-Working Group dischargers~~ The way that this deadline applies to a particular discharger differs depending on whether the discharger is participating in the Working Group:

1. Working Group Participants. Provisions in NPDES permits/WDRs issued during implementation of the Work Plan will specify the following for Working Group members:

(a) Interim effluent limitations. Participation in the Working Group and timely and effective implementation of the Regional Board-approved Work Plan will constitute interim, performance-based effluent limitations to implement the wasteload allocations. Adhering to these interim effluent limitations satisfies the requirement, during the Work Plan implementation period, to achieve compliance with the TMDLs and wasteload allocations "as soon as possible."

(b) Final effluent limitations. Final effluent limitations based on the wasteload allocations will also be specified, with a schedule requiring compliance as soon as possible but no later than December 31, 2015.² Compliance with the interim, performance-based limitations will fulfill the "as soon as possible" requirement. The NPDES permits/WDRs will specify further that the status of compliance with the final

² It is recognized that this schedule may exceed the five year terms of NPDES permits. This schedule will be reflected in subsequent renewals of these NPDES permits.

effluent limitations based on the wasteload allocations will be reviewed on an annual basis. Compliance with these limitations will be required prior to the completion of the Work Plan tasks, in accordance with a schedule approved by the Regional Board's Executive Officer, if it is demonstrated to the satisfaction of the Executive Officer that such earlier compliance is reasonably feasible.

Following the completion of the Work Plan tasks, NPDES permits/WDRs will require dischargers to comply with wasteload allocations in the shortest practicable time, but in no event later than December 31, 2015.

2. Non-Working Group Dischargers. For dischargers not participating in the Working Group, NPDES permit/WDR provisions will require compliance with the wasteload allocations as soon as possible after adoption of NPDES permits/WDRs that implement the TMDLs, but no later than December 31, 2015. The In this case, the determination of what constitutes "as soon as possible" will be at the discretion of the Regional Board's Executive Officer.

Completion of the Work Plan and/or other investigations conducted by the Regional Board or others may result in modification of the TMDLs, wasteload allocations and the compliance schedule through the Basin Planning process. Subsequent issuance/revision of NPDES permit/WDRs will implement any such changes.

Ultimate compliance with permit limitations based on wasteload allocations is expected to be based upon iterative implementation of effective BMPs to manage the discharge of fine sediments containing organochlorine compounds, along with monitoring to measure BMP effectiveness.

Permit revisions shall be accomplished as soon as possible upon approval of these TMDLs. Given Regional Board resource constraints and the need to consider other program priorities, permit revisions are likely to be tied to renewal schedules.

For commercial nurseries covered under existing WDRs, revisions of these WDRs shall address the following identified needs:

- (1) Evaluation of sites to determine/verify potential storm water and nonstorm water discharge locations;
- (2) Evaluation of current monitoring programs and methods of sampling and analysis for consistency with other monitoring efforts in the watershed;
- (3) In cooperation with U.C. Cooperative Extension, evaluation of BMPs for adequacy and implementation of the most effective BMPs to reduce/eliminate the discharge of potentially-contaminated fine sediments in both storm water and non-storm water discharges;
- (4) Monitoring to better quantify nursery runoff as a potential source of organochlorine compounds and to assure that load reductions are achieved; and

- (5) Based on the results of the preceding tasks, development of a workplan to be submitted within one month of the effective date of these TMDLs that identifies: (a) the BMPs implemented to date and their effectiveness in reducing fine sediment and organochlorine compound discharges; (b) the adequacy and consistency of monitoring efforts, and proposed improvements; (c) a plan and schedule for implementation of revised BMPs and monitoring protocols, where appropriate. It is recognized that most nursery operations are likely to be of very limited duration due to the expiration of land leases. The workplan shall identify recommendations for BMP and monitoring improvements that are effective, reasonable and practicable, taking this consideration into account. This workplan shall be implemented upon approval by the Regional Board Executive Officer.

Revisions to the Municipal Separate Storm Sewer System (MS4) permit (R8-2002-0010, NPDES No. CAS618030) and), including the monitoring program shall address the monitoring and BMP-related tasks identified below, as appropriate. The Regional Board will coordinate also with the State Water Resources Control Board regarding revision of the Caltrans permit to address these monitoring and BMP-related tasks. These include: oversight and implementation of construction BMPs (Task 4); organochlorine compound source evaluations (Task 5); assessment of dredging feasibility and identification of a funding mechanism (Task 6); and, revision of the regional monitoring program (Task 8).

NPDES permits that regulate discharges of ground water to San Diego Creek or its tributaries shall be reviewed and revised as necessary to require annual (at a minimum) monitoring, using the most sensitive analytical techniques practicable, to analyze for organochlorine compounds in the discharges. If organochlorine compounds are found to be present, the dischargers shall be required to evaluate whether and to what extent the discharges would cause or contribute to an exceedance of wasteload allocations and to implement appropriate measures to reduce or eliminate organochlorine compounds in the discharges. New NPDES permits issued for these types of discharges shall incorporate the same requirements.

These dischargers (nurseries, MS4 permittees, Caltrans, ground water dischargers) may address the specific requirements identified above through their participation in the development and implementation of an appropriate, Regional Board approved Work Plan (see Task 7).

Task 2: Develop and Implement an Agricultural BMP and Monitoring Program

Apart from certain nurseries, agricultural operations in the watershed are not currently regulated pursuant to waste discharge requirements. The SWRCB's "Policy for Implementation and Enforcement of the Nonpoint Source Pollution Control Program" (Nonpoint Source Policy) (2004) requires that all nonpoint source

dischargers be regulated under WDRs, waivers of WDRs, Basin Plan prohibitions, or some combination of these three administrative tools. Board staff is developing recommendations for an appropriate regulatory approach to address agricultural discharges. It is expected that the Regional Board will be asked to consider these recommendations and to approve a regulatory approach in late 2007. Appropriate load allocations to implement these TMDLs will be included in WDRs or a waiver of WDRs, if and when issued by the Regional Board to address discharges from agricultural operations.

In the interim, agricultural operators shall identify and implement a monitoring program to assess OCs discharges from their facilities, and identify and implement a BMP program designed to reduce or eliminate those discharges. The proposed monitoring and BMP program shall be submitted as soon as possible but no later than *(3 months from OAL approval of this Basin Plan Amendment (BPA))*. These monitoring and BMP programs will be components of the waste discharge requirements or conditional waiver of waste discharge requirements that Board staff will recommend to implement the Nonpoint Source Policy. Load allocations identified in these TMDLs will also be specified in the WDRs/waiver, with a schedule of compliance.

It is recognized that most agricultural operations are expected to be of very limited duration due to the expiration of land leases. The monitoring and BMP programs proposed by the agricultural operators should include recommendations that are effective, reasonable and practicable, taking this consideration into account. The BMP and monitoring programs shall be implemented upon approval by the Regional Board. The BMP and monitoring programs may be implemented individually or by a group or groups of agricultural operators.

In addition, responsible parties may address these BMP/monitoring program requirements through their participation in the development and implementation of an appropriate, Regional Board approved Work Plan (see Task 7). WDRs or conditional waivers of WDRs issued to agricultural operators pursuant to the Nonpoint Source Policy shall specify that for those operators who participate in the development and implementation of a Regional Board approved Work Plan, compliance with the TMDLs and load allocations will not be required prior to the five-year completion of execution of the Work Plan, is to be achieved as soon as possible, but no later than December 31, 2015. The way that this deadline applies to a particular agricultural operator differs depending on whether the operator is participating in the Working Group:

1. Working Group Participants. Provisions in WDRs or conditional waivers of WDRs issued subsequent to the completion of execution during implementation of the Work Plan will require compliance with load allocations as soon as possible but no later than December 31, 2015. Agricultural operators who elect not to participate in the Work Plan shall be required to achieve compliance "as soon as possible", as

determined by the Executive Officer (see also Task 1). specify the following for Working Group members:

(a) Interim limitations: Participation in the Working Group and timely and effective implementation of the Regional Board-approved Work Plan will constitute interim, performance-based limitations to implement the load allocations. Adherence to these interim limitations satisfies the requirement, during the Work Plan implementation period, to achieve compliance with the TMDLs and load allocations "as soon as possible."

(b) Final limitations: Final limitations- based on the load allocations will also be specified in the WDRs/waivers, with a schedule requiring compliance as soon as possible but no later than December 31, 2015. Compliance with the interim, performance-based limitations will fulfill the "as soon as possible" requirement. The WDRs/waivers will specify further that the status of compliance with the final limitations based on the load allocations will be reviewed on an annual basis. Compliance with these limitations will be required prior to the completion of the Work Plan tasks, in accordance with a schedule approved by the Regional Board's Executive Officer, if it is demonstrated to the satisfaction of the Executive Officer that such earlier compliance is reasonably feasible.

Following the completion of the Work Plan tasks, WDRs/waivers will require agricultural operators to comply with load allocations in the shortest practicable time, but in no event later than December 31, 2015.

2. Non-Working Group Dischargers. For agricultural operators not participating in the Working Group, provisions in WDR/waivers of WDRs will require compliance with the load allocations as soon as possible after adoption of WDRs/waivers of WDRs that implement the TMDLs, but no later than December 31, 2015. In this case, the determination of what constitutes "as soon as possible" will be at the discretion of the Regional Board's Executive Officer.

Completion of the Work Plan and/or other investigations conducted by the Regional Board or others may result in modification of the TMDLs, load allocations and the compliance schedule through the Basin Planning process. Subsequent issuance/revision of WDRs/conditional waivers of WDRs will implement any such changes.

Task 3: Identify Parties Responsible for Open Space Areas; Develop and Implement an OCs Monitoring Program to Assess Open Space Discharges; Develop and Implement an OCs BMP Program, if Necessary

Nonpoint source discharges from open space are also subject to State regulation. During Phase I of these TMDLs, sufficient data shall be collected by the responsible parties to determine whether discharges of OCs from designated open space, as

well as discharges resulting from erosion in and adjacent to unmodified streams, are causing or contributing to exceedances of water quality objectives and/or impairment of beneficial uses of San Diego Creek and Newport Bay. With the assistance of the stakeholders, Regional Board staff will identify the responsible parties as soon as possible but no later than (*one month from OAL approval of this BPA*). Board staff will notify the identified responsible parties of their obligation to propose an organochlorine compound monitoring program within two months of notification. The monitoring program shall be implemented upon Regional Board approval.

Based on the results of this monitoring program, the responsible parties shall develop a BMP implementation plan within 6 months of notification by the Regional Board's Executive Officer of the need to do so. The responsible parties shall implement that plan upon Regional Board approval.

The responsible parties may address these monitoring and BMP implementation program requirements through their participation in the development and implementation of an appropriate, Regional Board approved Work Plan (see Task 7).

The Regional Board will consider whether WDRs or a WDR waiver is necessary and appropriate for responsible parties not currently regulated, based on the monitoring results. WDRs or a WDR waiver, if issued, will include appropriate load allocations to implement these TMDLs. ~~For responsible parties participating in the Working Group, compliance with these the TMDLs and load allocations will not be required prior to the five year completion of execution of the Work Plan. WDRs/WDR waivers issued to Working Group members subsequent to completion of execution of the Work Plan will require compliance with load allocations as soon as possible but no later than December 31, 2015. Responsible parties not participating in the Work Plan will be required to meet the load allocations as soon as possible, as determined by the Executive Officer.~~ is to be achieved as soon as possible, but no later than December 31, 2015. The way that this deadline applies to a particular responsible party differs depending on whether that responsible party is participating in the Working Group:

1. Working Group Participants. Provisions in WDRs or conditional waivers of WDRs issued during implementation of the Work Plan will specify the following for Working Group members:

(a) Interim limitations: Participation in the Working Group and timely and effective implementation of the Regional Board-approved Work Plan will constitute interim, performance-based limitations to implement the load allocations. Adherence to the interim, performance-based limitations satisfies the requirement, during the Work Plan implementation period, to achieve compliance with the TMDLs and load allocations "as soon as possible."

(b) Final limitations: Final limitations based on the load allocations will also be specified in the WDRs/waivers, with a schedule requiring compliance as soon as possible but no later than December 31, 2015. Compliance with the interim, performance-based limitations will fulfill the "as soon as possible" requirement. The WDRs/waivers will specify further that the status of compliance with the final limitations based on the load allocations will be reviewed on an annual basis. Compliance with the final limitations will be required prior to the completion of the Work Plan tasks, in accordance with a schedule approved by the Regional Board's Executive Officer, if it is demonstrated to the satisfaction of the Executive Officer that such earlier compliance is reasonably feasible.

Following the completion of the Work Plan tasks, WDRs/waivers will require responsible parties to comply with load allocations in the shortest practicable time, but in no event later than December 31, 2015.

2. Non-Working Group Dischargers. For responsible parties not participating in the Working Group, compliance with the load allocations will be as soon as possible after TMDLs adoption and approval, but no later than December 31, 2015. In this case, the determination of what constitutes "as soon as possible" will be at the discretion of the Regional Board's Executive Officer.

Completion of the Work Plan and/or other investigations conducted by the Regional Board or others may result in modification of the TMDLs, load allocations and the compliance schedule through the Basin Planning process. Subsequent issuance/revision of WDRs/conditional waivers of WDRs will implement any such changes.

Task 4: Develop and Implement Appropriate BMPs for Construction Activities

Currently, all construction activities in the watershed are regulated under the State Water Resource Control Board's (SWRCB) General Permit for Discharge of Storm Water Runoff Associated with Construction Activity (Order No. 99-08-DWQ, NPDES No. CAS000002; the "General Construction Permit"), and/or the MS4-SWRCB National Pollutant Discharge Elimination System (NPDES) Permit Statewide Storm Water Permit and Waste Discharge Requirements (WDRs) for the State of California, Department of Transportation (Caltrans) (Order No. 99-06-DWQ, NPDES No. CAS000003; the Caltrans MS4 permit), and/or the Orange County MS4 NPDES permit. The requirements of these permits and an iterative, adaptive-management BMP approach, coupled with monitoring, are the foundation for meeting the TMDL WLAs for construction. ~~Both the~~ The General Construction Permit, and the Orange County and Caltrans MS4 permit ~~permits~~ are expected to be revised over time. The specific tasks identified below may be addressed by revisions to one or ~~both~~ more of these permits. In that case, the Regional Board will integrate requirements for implementation of this Task with the requirements of the Orange County and Caltrans MS4/General Construction permit ~~permits~~ so as to prevent conflict and/or duplication of effort.

To assure that effective construction BMPs are identified and implemented, program improvements are needed in the following areas: (a) Storm Water Pollution Prevention Plans (SWPPPs) prepared in response to the General Construction Permit must include supporting documentation and assumptions for selection of sediment and erosion control BMPs, and must state why the selected BMPs will meet the Construction WLAs for the organochlorine compounds; (b) SWPPP provisions must be rigorously implemented on construction sites; (c) sampling and analysis for the organochlorine pesticides and PCBs in storm and nonstorm discharges containing sediment from construction sites is necessary to determine the efficacy of BMPs, as well as compliance with the construction WLAs; sampling and analysis plans must be included in SWPPPs; (d) additional BMPs, including enhanced BMPs, must be evaluated to determine those that may be appropriate for reducing or eliminating organochlorine compound discharges from construction sites (e.g., BMPs effective in control of fine particulates) without significant adverse environmental effects (e.g., toxicity that might result from improper storage and/or application of polymers); ~~(e) outreach and training are necessary to assure the effective implementation of~~ communicate these SWPPP requirements and assure their effective implementation; and (e) enforcement of the SWPPP requirements is necessary.

To address these program improvements, Regional Board staff shall develop a SWPPP Improvement Program that identifies the Regional Board's expectations with respect to the content of SWPPPs, including documentation regarding the selection and implementation of BMPs, and a sampling and analysis plan. The Improvement Program shall include specific guidance regarding the development and implementation of monitoring plans, including the constituents to be monitored, sampling frequency and analytical protocols. The SWPPP Improvement Program shall be completed by *(the date of OAL approval of this BPA)*. No later than two months from completion of the Improvement Program, Board staff shall assure that the requirements of the Program are communicated to interested parties, including dischargers with existing authorizations under the General Construction Permit, ~~and provide training as necessary~~. Existing, authorized dischargers shall revise their project SWPPPs as needed to address the Program requirements as soon as possible but no later than *(three months of completion of the SWPPP Improvement Program)*. ~~Upon completion of needed outreach and training concerning the requirements of the SWPPP Improvement Program, applicable~~ Applicable SWPPPs that do not adequately address the Program requirements shall be considered inadequate and enforcement by the Regional Board shall proceed accordingly. The Caltrans and Orange County MS4 permit permits shall be revised as needed to assure that the permittees communicate the Regional Board's SWPPP expectations, based on the SWPPP Improvement Program, with the Standard Conditions of Approval.

The MS4 permittees shall conduct studies to evaluate BMPs that are most appropriate for reducing or eliminating organochlorine compound discharges from

construction sites (e.g., fine particulates), including advanced treatment BMPs. The evaluation shall consider the potential for adverse environmental effects associated with implementation of each of the BMPs identified. MS4 Permittees shall include these BMPs in the Orange County Stormwater Program Construction Runoff Guidance Manual and the Caltrans Storm Water Management Plan (SWMP). Implementation of these MS4 permit requirements shall commence upon issuance of appropriate Water Code Section 13267 letters or approval/renewal of an appropriately revised the MS4 permits, whichever occurs first. Revisions to the MS4 permit/permits or Caltrans SWMP shall implement requirements specified in applicable Section 13267 letters, if used to implement TMDL-related requirements. The Section 13267 letters/revised permit/permits shall require the permittees to: (a) submit a proposed plan and schedule for studies to evaluate appropriate BMPs, as described above, within three months of issuance of the 13267 letter or permit revision; (b) implement the plan and schedule upon approval by the Regional Board's Executive Officer; (c) submit a report of the BMP investigations within 6 months of approval of the study plan, provided that sufficient storms, as defined in the study plan, have occurred within that period. If the number of storms does not conform to the study plan, then the report shall be submitted in accordance with a schedule approved by the Executive Officer once the requisite number of storms has occurred. The report shall include a proposed plan and schedule for implementation of the BMPs, as appropriate, and inclusion of the BMPs in the Orange County Guidance Manual and in the Caltrans SWMP and related guidance documents; (d) implement the BMP plan upon approval by the Executive Officer.

The MS4 permittees may address these SWPPP and construction site BMP-related requirements through their participation in the development and implementation of an appropriate, Regional Board approved Work Plan (see Task 7).

**Task 5: Evaluate Sources of OCs to San Diego Creek and Newport Bay:
Identify and Implement Effective BMPs to Reduce/Eliminate Sources**

Based on the regional monitoring program being implemented by the Orange County MS4 permittees and/or on the results of other monitoring and investigations, the all MS4 permittees shall conduct source analyses in areas tributary to the MS4 system demonstrating elevated concentrations of OCs. Based on mass emissions monitoring (described below) and source analysis, the permittees shall implement additional/enhanced BMPs as necessary to ensure that organochlorine discharges from significant land use sources to surface waters are reduced or eliminated. As part of the investigation task, if the results indicate that additional OCs soil remediation is necessary on MCAS Tustin and MCAS El Toro, the responsible parties for such remediation will be identified. The responsible party will be tasked to implement those portions of the BMP plan identified for the responsible party for MCAS Tustin and MCAS El Toro.

The permittees shall develop and implement a collection program for all banned OC pesticides and PCBs. This type of program has had demonstrated success in other geographic areas in collecting and disposing of banned pesticides. Residents and businesses in the watershed may have stored legacy pesticides that could be collected through such a program; if this is the case, this task would prevent future use and improper disposal of these banned pesticides.

Implementation of these requirements shall commence upon issuance of appropriate Water Code Section 13267 letters or approval of an appropriately revised MS4 permits, whichever occurs first. Revisions to the Orange County MS4 permit and Caltrans SWMP shall implement requirements specified in applicable Section 13267 letters, if used to implement TMDL-related requirements. The 13267 letters/revised permit shall specify require the permittees to: (a) submit a proposed plan and schedule for source analyses of MS4 tributary areas with elevated OCs concentrations within 3 months of issuance of the 13267 letters or permit revision; (b) implement the proposed plan upon approval by the Regional Board's Executive Officer; (c) submit a report within 6 months of completion of the approved study plan. The report shall provide the study results and include a proposed plan and schedule for prioritized implementation of BMPs in OCs source areas; (d) implement the BMP plan upon Executive Officer approval.

The permittees may address these requirements through their participation in the development and implementation of an appropriate, Regional Board approved Work Plan (Task 7).

Task 6: Evaluate Feasibility and Mechanisms to Fund Future Dredging Operations

Because large-scale erosion and sedimentation primarily occurs during large storm events, traditional BMPs may have limited success in reducing/eliminating the discharge of potentially-contaminated sediments to receiving waters during wet weather. In such cases, dredging within Newport Bay and/or San Diego Creek may be the most feasible and appropriate method of reducing OCs loads in these waters. However, the feasibility and effectiveness of dredging projects in removing OCs would require careful consideration, since dredging may or may not expose sediments with higher concentrations of OCs. Financing of such projects is also a significant consideration.

Entities discharging potentially contaminated sediment in the watershed shall analyze the feasibility of dredging to achieve water quality standards, and shall identify funding mechanisms for ensuring that future dredging operations can be performed, as necessary, within San Diego Creek, Upper and Lower Newport Bay. A report that presents the results of this effort shall be submitted no later than *(three years from the date of OAL approval of this BPA)*. It is recognized that dredging activities are likely to be an integral part of efforts to comply with other established TMDLs, particularly the sediment TMDL. Ideally, dredging feasibility and funding investigations would be integrated with implementation and review of the sediment TMDL through the comprehensive Work Plan (Task 7). The responsible parties may address this Task requirement through their participation in the development and implementation of an appropriate, Regional Board approved Work Plan.

Task 7: Develop a Comprehensive Work Plan to Meet TMDL Implementation Requirements, Consistent with the Adaptive Management Approach

During the development of these organochlorine compounds TMDLs, regulated stakeholders in the Newport Bay watershed expressed concerns that the numeric targets used to develop the TMDLs, wasteload allocations and load allocations were flawed and that scientific review by an independent panel of experts was necessary. Further, these stakeholders suggested that pollutants other than the organochlorine compounds, such as metals, pyrethrins or other, emerging pollutants may pose the more real or significant threat to beneficial uses in the watershed. Finally, it was recommended that an integrated approach to TMDL implementation, ~~as well as~~ and to the development of pending TMDLs and refinement of established TMDLs, would be a more effective and efficient approach.

Substantial efforts are already being made by many stakeholders in the watershed to address established permit and/or TMDL requirements for BMP implementation and monitoring and to conduct special investigations to understand and improve water quality conditions in the watershed. Thus, the framework exists to develop a

comprehensive watershed plan for addressing water quality, not only as it relates to the organochlorine compounds, but on a larger scale that encompasses all sources of water quality impairment.

This implementation plan provides the opportunity for regulated stakeholders to form a Working Group and to participate in the development and implementation of a comprehensive Work Plan to evaluate the scientific basis of these organochlorine TMDLs, to prioritize TMDL implementation tasks, to integrate implementation with other TMDL and/or permit requirements, and to investigate unknown sources of toxicity in the watershed. As noted in the previous Task descriptions, participation by responsible parties in the Working Group and the development and implementation of a Regional Board Work Plan would address the responsible parties' obligations pursuant to the Tasks in Table NB-OCs-13. Dischargers who elect not to participate in the Working Group/Work Plan will be required to implement these Tasks, as described above.

Dischargers interested in participating in a Working Group to develop and implement a comprehensive Work Plan must commit to do so by (*within one month of OAL approval of the BPA*). Submittal of a draft Work Plan is required no later than (*three months of OAL approval of the BPA*). The schedules for implementation of the tasks identified in the Work Plan must reflect the shortest practicable time necessary to complete the tasks. Implementation of the Work Plan will commence upon approval of the Work Plan by the Regional Board at a properly noticed public hearing. Execution of the Work Plan must be complete within five years of Regional Board approval. Substantive changes to the tasks and schedules included in the approved Work Plan are contingent on Regional Board approval at a subsequent, properly noticed public hearing(s). However, the Regional Board's Executive Officer is authorized to revise the approved tasks and schedules if no significant comments are received during the public notice period.

At a minimum, the expected result of the execution of the Work Plan is a comprehensive, watershed plan for BMP implementation, monitoring, special investigations and other actions that will assure compliance with the OCs TMDLs, as they may be amended, as soon as possible after completion of execution of the Work Plan but no later than December 31, 2015³.

The specific detailed Work Plan tasks and schedules will be determined as the Work Plan is developed. Regional Board staff will work with the Working Group to identify a suitable Work Plan. Key initial tasks are expected to include the following:

1. Convene an Independent Advisory Panel (IAP) of experts with relevant expertise. To avoid questions of objectivity, the panel shall be convened by a neutral third party organization such as the National Water Research Institute. The Working Group and Regional Board staff will work together to define the desired qualifications needed for IAP participants, define the scope and

³ This compliance date is subject to change through the Basin Planning process.

authority of the IAP, and identify and describe the primary issues that will require guidance, recommendations, or specific actions from the IAP.

2. Re-evaluate OCs TMDLs Numeric Targets and Loads

With input and recommendations from the IAP, and using data being generated through ongoing scientific investigations in the watershed, the Work Plan should assess the current OCs TMDLs numeric targets, evaluate potential alternative numeric targets, and determine if the current targets should be revised, or whether targets based on site-specific data can be developed. If site-specific targets can be developed, the process or methods that will be used to develop targets should be determined, such as risk assessments or re-calculation of targets using accepted, peer-reviewed scientific methodologies.

It is recognized that there is a need for flexibility to respond to unanticipated findings and events, and to changes that may be recommended by the Independent Advisory Panel (see below). However, at a minimum, each of the Tasks identified in Table NB-OCs-13 (except Task 1, which requires action by the Regional Board, and Task 4, which requires action by the Regional Board and the MS4 permittees based on established MS4 permit requirements) must be considered in Work Plan development and implementation. If one or more of these tasks is not proposed for inclusion in the Work Plan, or where modifications of these tasks/schedules are recommended, a written description and justification must be provided with the draft Work Plan submittal. In addition, consideration shall be given to the following:

Develop conceptual models

Data interpretation and monitoring must be organized around a systematic conceptual view of the sources of the different organochlorine compounds and their distribution and behavior in the watershed. Development of conceptual models for these compounds would significantly enhance our understanding of their sources and impacts and would help to structure hypothesis development, monitoring design, and data interpretation. Development of the conceptual models should be based on a review of available data and information about the OCs in the watershed, and the models should be updated as new information accumulates. Characterization of sources and of habitats at risk should be based on a review of available data, framed in terms of the conceptual models and supported with the collection of new data as needed. It is expected that the IAP would provide critical review and recommendations in this process.

Develop Information Management System

Different types of data – water column, sediment, fish or bird egg tissue, infaunal surveys, hydrology, etc. – are being or will be collected throughout

the Newport Bay watershed through a variety of studies, monitoring programs, or other projects. Since these data are often collected for different purposes (e.g., in response to various TMDLs and/or permits), at different times and in different areas, much of the data may be in non-comparable formats, redundant, or not spatially or temporally compatible. In order to determine what data are useful or significant, where data gaps may still occur, or where current data needs are sufficient, a comprehensive information management system should be developed that (1) establishes clear procedures for assessing data quality for data acquisition and transfer and for control of evolving versions of datasets; (2) is a relational database that can manage the variety of data types and has appropriate mechanisms for ensuring and maintaining data quality; (3) can conduct quality control checks and needed reformatting to ensure needed consistency across all data types and sources as data from other sources are obtained; (4) provides for straightforward query and data sub-setting routines to streamline access to the data; and (5) ensures that GIS capability is available for analysis, modeling, and presentation purposes. Development of a comprehensive information management system will allow for the identification of significant data gaps that need to be addressed and will provide a vehicle for establishing monitoring guidelines and preventing redundant or superfluous data collection.

To the extent that there are any conflicts between the individual tasks and schedules identified in Table NB-OCs-13 above, and the prioritized plan and schedule identified in the Work Plan, the Work Plan would govern implementation activities with respect to the stakeholders responsible for Work Plan development and implementation as part of the Working Group.

Task 8: Revise Regional Monitoring Program

The County of Orange, as Principal Permittee under the County's MS4 permit, oversees the countywide monitoring program. Implementation of the monitoring program is supported by funds shared proportionally by each of the Permittees named in the Orange County MS4 permit. Some monitoring requirements identified in this implementation plan are already reflected in the current program.

By (3 months from OAL approval of BPA), the Orange County MS4 permittees shall: (1) document each of the current monitoring program elements that addresses the monitoring requirements identified in the preceding tasks; and, (2) revise the monitoring program as necessary to assure compliance with these monitoring requirements.

Review of/revisions to the monitoring program shall address:

- (1) Estimation of mass emissions of chlordane, DDT, PCBs and toxaphene.

- (2) Determination of compliance with MS4 wasteload allocations for Upper and Lower Newport Bay, and of status of achievement with the informational wasteload allocations for San Diego Creek for chlordane and PCBs.
- (3) Assessment of temporal and spatial trends in organochlorine compound concentrations in water, sediment and tissue samples.
- (4) Semi-annual sediment monitoring in San Diego Creek and Newport Bay. Measurements of sediment chemistry in these waters should be evaluated with respect to evidence of biological effects, such as toxicity and benthic community degradation.
- (5) Evaluation of organochlorine bioaccumulation and food web biomagnification
- (6) Assessment of the degree to which natural attenuation is occurring in the watershed.

Accurately quantifying the very small mass loads that are allowable under these TMDLs will be very challenging; analytical strategies for quantifying loads of the organochlorine compounds must be carefully explored.

Revisions to the monitoring program shall take into consideration the following recommendations provided by members of the Organochlorine Compounds TMDL Technical Advisory Committee (TAC):

- (1) The analytical parameters measured need to be established for each matrix of interest (e.g., sediment, tissue, ambient water). The representative list of compounds to be measured needs to be identified (e.g., what chlordane compounds will be measured and summed to represent "total chlordane;" will PCB congeners be measured and summed or will Aroclors?).
- (2) Data quality will need to be consistent with the State's Surface Water Ambient Monitoring Program (SWAMP). Detection limits, accuracy and precision of analytical methods should be adequate to assure the goals of the monitoring efforts can be achieved.
- (3) Bioaccumulation/biomagnification in high trophic level predators may not immediately respond to load reductions; appropriate time scales and schedules for monitoring that are supported by empirical data and/or modeling should be established.
- (4) Sentinel fish and wildlife species should be selected for monitoring based on home range, life history, size and age.

MS4 permittees may address the requirements specified herein by participation in the Working Group and development and implementation of an appropriate, Regional Board approved Work Plan (see Task 7).

Task 9: Conduct Special Studies

The following special studies should be conducted, in addition to the studies already underway in the watershed. This list is based, in part, on recommendations of the technical advisory committee for the organochlorine compounds TMDLs. These studies will be implemented as resources become available, and the results will be used to review and revise these TMDLs. Stakeholder contributions to these investigations are encouraged and would facilitate review of the TMDLs.

- (1) Evaluation of sediment toxicity in San Diego Creek and tributaries, and Upper and Lower Newport Bay.

Previous studies have included Toxicity Identification Evaluations (TIEs) that have yielded inconclusive results as to the cause of toxicity in Newport Bay. Sediment toxicity within San Diego Creek is not well-documented or well-understood. There is evidence that pyrethroid compounds may be a significant contributor. In determining the extent to which nonpolar organic compounds are causing or contributing to sediment toxicity, the differential contribution of both the organochlorine compounds and pyrethroids should be determined to assure that control actions are properly identified and implemented. Monitoring should be performed year-round at multiple locations within San Diego Creek and Newport Bay (to encompass spatial and temporal variability), and should include various land use types in order to quantify the relative contributions from various sources.

- (2) Refinement of sediment and tissue targets.

A study is being conducted by the San Francisco Estuary Institute to develop indicators and a framework for assessing the indirect effects of sediment contaminants. The objective is to provide methodology that will assist in evaluating indirect adverse biological effects for bioaccumulative pollutants (e.g. due to food web biomagnification), as part of the overall goal of developing statewide sediment quality objectives. Newport Bay is being used as a case study to show how the proposed methodology could be implemented on a screening level. Multiple lines of evidence will be evaluated to determine impacts of organochlorine pesticides and PCBs to humans and wildlife. A conceptual foodweb model will be developed, and sensitive wildlife receptors will be identified. Empirical field data and a steady-state food web model will be used to calculate bioaccumulation factors for the organochlorine compounds. The bioaccumulation factors will be combined with effects thresholds to identify sediment concentrations that are protective of target wildlife and humans.

Once completed by SFEI, a thorough evaluation of the Newport Bay case study needs to be initiated, and any additional analyses required for a more in-depth risk analysis should be identified and completed. Protective sediment and tissue targets for indirect effects to humans and wildlife should be developed by the time the TMDLs are re-opened. Furthermore, once TIEs have identified the likely toxicant(s) responsible for sediment toxicity in San Diego Creek and Newport Bay (direct effects), field and laboratory studies should be conducted in order to determine

bioavailability and the dose-response relationship between sediment concentrations and biologic effects.

- (3) Evaluation of regional BMPs (e.g., constructed wetlands and sediment detention basins) for mitigating potential adverse water quality impacts of sediment-associated pollutants (e.g., OCs, pyrethroids).

Large-scale, centralized BMPs such as constructed wetlands and storm water retention basins may be more effective than project-level BMPs in reducing adverse environmental impacts of sediment-borne pollutants. Regional BMPs are either being planned or are in place within the watershed (e.g., IRWD NTS). Their potential effectiveness for capturing the organochlorine compounds and mitigating impacts needs to be evaluated.

- (4) Improvement in linkage between toxaphene measured in fish tissue and toxaphene in bed sediments.

The toxaphene impairment listing for San Diego Creek is based on fish tissue exceedances that have no measured linkage with toxaphene in sediments. While sediment is the primary TMDL target for these TMDLs, toxaphene is usually not detected in sediment. Because of its chemical complexity, there is a large degree of analytical uncertainty with measurements of toxaphene in environmental samples that use standard methods (e.g., EPA Method 8081a), especially at low levels. Confirmations of toxaphene in fish and sediment samples in San Diego Creek (and possibly Newport Bay) using other techniques (e.g., GC-ECNI-MS or MS/MS) is recommended.

- (5) Evaluation of relative importance of continuing OCs discharges to receiving waters through erosion and sedimentation processes, versus recirculation of existing contaminated bed sediments, in causing beneficial use impairment in San Diego Creek and Newport Bay.

This study should allow for determination of the most effective implementation strategies to reduce organochlorine compounds in the MS4 and other receiving waters.

Phase II Implementation

Task 10: TMDL Reopener

These TMDLs will be reopened no later than *(five (5) years following OAL approval of this BPA)* in order to evaluate the effectiveness of Phase I implementation. At that time, all new data will be evaluated and used to reassess impairment, BMP effectiveness, and whether modifications to the TMDLs are warranted. If BMPs

implemented during Phase I have been shown to be ineffective in reducing levels of organochlorine compounds, then more stringent BMPs may be necessary during Phase II implementation.

Implementation of these TMDLs and the schedule for implementation are very closely tied with other TMDLs that are currently being implemented in the watershed. The sediment TMDL allowable load for San Diego Creek was the basis for calculating organochlorine compound loading capacities. The sediment TMDL is scheduled for revision in 2007; changes to the sediment TMDLs will likely necessitate changes to these organochlorine compounds TMDLs as well.



ENVIRONMENTAL CHECKLIST AND ANALYSIS

SUBSTITUTE ENVIRONMENTAL DOCUMENT For the Organochlorine Compounds Total Maximum Daily Loads San Diego Creek, Upper Newport Bay and Lower Newport Bay

Orange County, California

**California Regional Water Quality Control Board
Santa Ana Region**

July 25, 2007

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1 California Environmental Quality Act Requirements

The California Regional Water Quality Control Board, Santa Ana Region (Santa Ana Water Board, or Regional Board) is required to comply with the California Environmental Quality Act (CEQA)¹ when considering an amendment to the Water Quality Control Plan for the Santa Ana River Basin (Basin Plan)². The proposed amendment addressed in the following analysis would incorporate total maximum daily loads (TMDLs) for certain organochlorine compounds for San Diego Creek, Upper Newport Bay and Lower Newport Bay, Orange County, California. The Santa Ana Water Board is the Lead Agency responsible for evaluating the potential environmental impacts of the amendment and, in particular, the potential effects of the reasonably foreseeable methods of compliance with the proposed TMDLs.

The State Resources Agency has certified the Water Quality Control (Basin) Planning Program of the State and Regional Water Boards as exempt from the requirement to prepare an Environmental Impact Report (EIR), Negative Declaration (ND) or Initial Study³. In lieu of preparing these documents, the Santa Ana Water Board must comply with the State Water Resource Control Board's regulations on exempt regulatory programs when amending basin plans⁴. These regulations require the completion of an Environmental Checklist and a written report that includes: (1) a brief description of the proposed activity; (2) reasonable alternatives to the proposed activity; and (3) mitigation measures to minimize any significant adverse environmental impacts of the proposed activity. The Environmental Checklist for the proposed Basin Plan amendment is presented in Section 5 of this report. Two written reports have been prepared that describe the proposed amendment and its technical basis and that identify reasonable alternatives and mitigation measures: this Substitute Environmental Document dated July 25, 2007 and the November 17, 2006 TMDL technical staff report ("Total Maximum Daily Loads for Organochlorine Compounds - San Diego Creek: Total DDT and Toxaphene; Upper and Lower Newport Bay: Total DDT, Chlordane, Total PCBs, Orange County, California").

Further, CEQA establishes specific requirements for environmental and economic analysis of the proposed adoption of regulatory provisions in basin plans that require the installation of pollution control equipment, establish a performance standard⁵, or establish a treatment requirement⁶. The proposed

¹ Public Resources Code Sec. 21000 *et seq*

² Public Resources Code Sec. 21080

³ California Code of Regulations, Title 14, Sec. 15251(g)

⁴ California Code of Regulations, Title 23, Sec. 3775-3782

⁵ The term "performance standard" is not defined in CEQA but in the rulemaking provisions of the Administrative Procedures Act (Government Code Sec. 11340-11359). A "performance standard" is a regulation that describes an objective with the criteria stated for achieving the objective (Government Code Sec. 11342(d))

⁶ Public Resources Code Sec. 21159; California Code of Regulations, Title 14, Sec. 15187

TMDLs addressed here include numeric targets that interpret narrative water quality objectives established in the Basin Plan. They also include wasteload and load allocations to achieve these targets. The numeric targets together with the allocations may be considered a performance standard. Compliance with the targets and allocations may require the installation or enhancement of pollution control measures. Accordingly, pursuant to these CEQA requirements, the Santa Ana Water Board must conduct an environmental analysis of the reasonably foreseeable methods of compliance with the proposed TMDLs. This analysis must include at least the following:

- (1) An analysis of reasonably foreseeable environmental impacts of the methods of compliance;
- (2) An analysis of reasonably foreseeable mitigation measures relating to those impacts; and
- (3) An analysis of reasonably foreseeable alternative means of compliance that would avoid or eliminate the identified impacts.⁷

This analysis must take into account a reasonable range of environmental, economic and technical factors, population and geographic areas, and specific sites. Where specific data are not available, the Santa Ana Water Board may utilize numerical ranges and averages but is neither required nor encouraged to engage in speculation or conjecture.⁸

This Substitute Environmental Document, together with the November 17, 2006 technical report, provides the requisite analysis of reasonably foreseeable methods of compliance, alternatives and mitigation measures.

1.1 Scope of Environmental Analysis

The Santa Ana Water Board is prohibited from specifying the manner of compliance with its regulations.⁹ Dischargers subject to the proposed TMDLs and wasteload/load allocations are responsible to identify compliance strategies, and to conduct requisite CEQA analysis of implementation of the selected strategies at the project level.¹⁰ The Santa Ana Water Board cannot, as a practical matter, conduct project level CEQA analyses, nor is it required to do so¹¹.

Consistent with the requirements described above, the following analysis identifies a reasonable range of reasonably foreseeable compliance strategies (Section x) and evaluates reasonably foreseeable environmental effects (Section y, mitigation measures (Section z) and alternative means of compliance (Section v). This analysis takes into consideration a reasonable range of environmental

⁷ California Code of Regulations, Title 14, Sec. 15187(c)

⁸ *Id.* Sec. 15187(d)

⁹ Water Code section 13360

¹⁰ Public Resources Code section 21159.2

¹¹ Public Resources Code section 21159(d)

and economic factors, population and geographic areas and specific sites, as required. The Santa Ana Water Board intends this analysis to serve as a first tier environmental document¹².

2 Description of the Proposed Activity

The proposed Basin Plan amendment would incorporate into the Santa Ana Basin Plan TMDLs for the organochlorine compounds total DDT, total PCBs, chlordane, and toxaphene for the Newport Bay/San Diego Creek watershed. Specifically, TMDLs are proposed for DDT and toxaphene in San Diego Creek, and for DDT, chlordane, and PCBs in Upper Newport Bay and Lower Newport Bay. In addition, informational TMDLs for PCBs and chlordane are proposed for San Diego Creek. The purpose of the proposed TMDLs is to achieve and maintain compliance with relevant water quality objectives, including narrative objectives for toxic substances specified in the Basin Plan, and to protect the beneficial uses of these waters. The technical basis for and derivation of the proposed TMDLs and their individual components, including the numeric targets, wasteload allocations and load allocations, are described in detail in the November 17, 2006 TMDL technical report.

The proposed TMDLs include wasteload allocations for the following sources: urban, construction, highways (Caltrans) and commercial nurseries. Load allocations are identified for agriculture (other than the commercial nurseries regulated under existing waste discharge requirements), open space, streams and channels, and undefined sources. It is expected that these allocations will be implemented principally through new or revised waste discharge requirements (including NPDES permits) and/or conditional waivers of waste discharge requirements. Appropriate monitoring requirements will be established to assess compliance with the allocations and TMDLs and to identify needs for enhancement of control measures (e.g., Best Management Practices (BMPs)).

A plan to implement the TMDLs is also proposed as part of the amendment. As required¹³, the proposed implementation plan describes: the actions necessary to achieve the TMDLs, including wasteload and load allocations; identifies schedules for these actions, including a final compliance date; and specifies the monitoring that must be conducted to assess compliance. As described in the November 17, 2006 TMDL technical report (Section 8) and in the proposed amendment (Attachment to Resolution No. R8-2007-0024, Section 4.b.3), a phased, adaptive management implementation approach is recommended. This approach provides for additional investigation and monitoring needed to address

¹² A "first tier" environmental document provides the coverage of broad environmental issues for incorporation into later, project-specific environmental documents. (California Code of Regulations, Title 14, Secs. 15152, 15385; see also *Koster v. County of San Joaquin* (1996) 47 Cal.App.4th 29, 36-37.)

¹³ Water Code Section 13242

technical uncertainties, recognizes that natural attenuation of the organochlorine compounds may affect impairment findings and the need for TMDLs/control actions, and allows responsible parties a reasonable period of time to come into compliance. The tasks to be implemented by these parties focus on the control of erosion and sediment transport since the primary mechanism of organochlorine compound transport in the watershed is via sediment. Monitoring and special investigation requirements are identified to provide data with which to evaluate compliance with the TMDLs and to refine the TMDLs and implementation plan over time. Consistent with the recommendations of stakeholders in the watershed, the proposed implementation plan allows for an integrated Work Plan approach to address the implementation of the proposed organochlorine compounds TMDLs, as well as other established TMDLs (see discussion below), and to investigate other potential sources of impairment in the watershed in a coordinated and comprehensive manner.

3 Environmental Setting

3.1 Surrounding Land Uses and Setting

The Newport Bay watershed covers an area of 154 square miles (98,500 acres) in central Orange County, California. The San Diego Creek watershed is part of the larger Newport Bay watershed and occupies about 105 square miles. The remainder of the Newport Bay watershed includes the Santa Ana Delhi Channel, Bonita Creek, Big Canyon Wash, and other small freshwater streams. The waterbodies addressed by the proposed TMDLs include: Lower Newport Bay, that portion of the Bay south of the Pacific Coast Highway Bridge; Upper Newport Bay, predominantly a 752-acre estuary; and, San Diego Creek and its tributaries. Flows from the San Diego Creek watershed constitute the major freshwater input to the Bay.

Land use in the watershed has changed dramatically over time, characterized by rapid and ongoing urbanization. Even so, significant open space areas remain. Land use data for 2002 showed that the watershed was comprised of approximately 75% urban, less than 5% agriculture, and about 20% open space, located mainly in the foothills and headland areas. The climate is Mediterranean, characterized by short, mild winters and dry summers. Average rainfall is about 13 inches per year, with 90 percent of the rainfall occurring between November and April. The hydrology of the watershed has been substantially altered over the past 150 years. The most dramatic change occurred with the channelization of San Diego Creek in the early 1960s, which caused the creek to discharge directly into Upper Newport Bay. San Diego Creek, Reaches 1 and 2, contributes about 85% of the freshwater flow volume to the Bay. More information on the watershed characteristics is found in Section 1.1 of the November 17, 2006 TMDL technical report.

3.2 Regulatory Setting

The Basin Plan designates the beneficial uses of waterbodies within the Santa Ana Region, establishes water quality objectives for the protection of these uses, and outlines a plan of implementation for maintaining and enhancing water quality. Beneficial uses, water quality objectives and the state's antidegradation policy¹⁴ together comprise federal "water quality standards".

Beneficial uses designated in the Basin Plan for San Diego Creek and Newport Bay that may be affected by the organochlorine compounds addressed by the proposed TMDLs include: Warm Freshwater Habitat (WARM) and Wildlife Habitat (WILD) [San Diego Creek and its tributaries]; Wildlife Habitat (WILD), Rare, threatened, or endangered species (RARE), Spawning, reproduction, and development (SPWN), Marine habitat (MAR), Shellfish harvesting (SHEL) and Commercial and sportfishing (COMM) (Upper and Lower Newport Bay). Upper Newport Bay also supports two additional aquatic beneficial uses: Estuarine habitat (EST) and Preservation of biological habitats of special significance (BIO).

The Basin Plan specifies two narrative objectives for toxic substances:

- (1) *Toxic substances shall not be discharged at levels that will bioaccumulate in aquatic resources to levels which are harmful to human health; and*
- (2) *The concentration of toxic substances in the water column, sediment of biota shall not adversely affect beneficial uses.*

Numeric water quality objectives for priority toxic pollutants (including the organochlorine compounds addressed by the proposed TMDLs) for California were established by the USEPA in 2000¹⁵.

Section 2.2 of the November 17, 2006 TMDL technical report also describes applicable water quality standards.

Organochlorine compounds possess physical and chemical properties that influence their persistence, fate, and transport in the environment. All of these compounds resist degradation, associate with sediments or other solids, and accumulate in the tissue of invertebrates, fish and mammals. Sediment transport is the principal mechanism of organochlorine compound movement in the Newport watershed. Bioaccumulation and food web magnification of these compounds poses the most significant threat to aquatic life and to human consumers of fish and shellfish. At sufficient concentrations in the water column, sediment and/or biota, these substances may also result in direct toxic effects on

¹⁴ State Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California"

¹⁵ California Toxics Rule (CTR) (40 CFR 131. 38)

exposed organisms. Evidence of these adverse impacts indicates violation of one or both of the narrative objectives for toxic substances established in the Basin Plan.

Section 303(d)(1)(A) of the CWA requires each State to identify those waters within its boundaries for which effluent limitations are not stringent enough to implement any water quality standard applicable to such waters. Waterbodies identified as impaired in accordance with that requirement are placed on the CWA 303(d) list. The CWA requires that TMDLs be established for these impaired waters.

In accordance with these requirements, San Diego Creek, Reach 1 and Reach 2, Upper Newport Bay and Lower Newport Bay were placed on the CWA 303(d) list due to toxic substances, sediment, nutrients and bacteria (Newport Bay only). The Regional Board has established, and USEPA has approved, TMDLs for sediment, nutrients, bacteria and certain toxic substances (diazinon and chlorpyrifos) for these waters. Implementation of the sediment and nutrient TMDLs relies, to a large extent, on the control of sediment loading to these waters. On June 14, 2002, in response to a consent decree, the US EPA promulgated organochlorine compounds TMDLs for San Diego Creek and Newport Bay. The TMDLs were established in response to an impairment assessment conducted by USEPA that showed fish tissue concentrations in excess of relevant screening values, indicating violations of the narrative toxicity objective established in the Basin Plan. The USEPA TMDLs do not include an implementation plan or compliance schedule; implementation plans are the responsibility of the state. Absent a Regional Board approved implementation plan, the Board must utilize its discretion in establishing permit limits and other requirements that implement USEPA's TMDLs. Since no compliance schedule is included in USEPA's TMDLs, there is no authorization for the Regional Board to provide schedules for compliance with TMDL-related requirements in permits: compliance is to be achieved immediately.

Regional Board staff undertook a review of the USEPA organochlorine compounds TMDLs as part of the consideration of a Basin Plan amendment to incorporate organochlorine compound TMDLs for Newport Bay and its watershed, with an implementation plan, in the Basin Plan. The first step was to conduct an updated impairment assessment, utilizing new data not available to USEPA and relying on the listing criteria and weight of evidence approach identified in the State Board's Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (September 2004) ("Listing Policy"). Based on that assessment, and on a subsequent assessment and findings by the State Board in support of approval of the 2006 Section 303(d) list, Board staff developed the proposed TMDLs for DDT, PCBs and chlordane for Upper and Lower Newport Bay, and for DDT and toxaphene for San Diego Creek. Board staff found no impairment due to chlordane or PCBs in San Diego Creek, but proposes informational TMDLs for these substances (informational

TMDLs would not need to be implemented). The 2006 Clean Water Act Section 303(d) list for the Santa Ana Region approved by USEPA confirms that TMDLs for the waterbody/pollutant combinations identified by Board staff are necessary. A more detailed discussion of Board staff's impairment assessment is provided in the November 17, 2006 TMDL Technical Report, Section 2.3. If the Regional Board adopts the proposed organochlorine compounds TMDLs and they are approved by the State Board, Office of Administrative Law (OAL) and the USEPA, then the approved TMDLs would supersede those established by USEPA. If the Regional Board's approved TMDLs do not include all the waterbody/pollutant combinations for which USEPA established TMDLs, then the Board must implement those remaining USEPA TMDLs, unless and until the waterbody/pollutant combinations are removed from the 303(d) list of impaired waters through an USEPA-approved delisting process or USEPA takes other action to withdraw the TMDLs.

Established TMDLs for Newport Bay and its watershed are being implemented to a significant degree by the issuance and enforcement of appropriate waste discharge requirements. The Regional Board and State Board have adopted waste discharge requirements, including National Pollutant Discharge Elimination System (NPDES) permits that regulate discharges within the Newport Bay watershed. These include the general construction stormwater permit issued by the State Board (Order No. 99-08-DWQ, NPDES No. CAS000002, "General Permit for Discharge of Storm Water Runoff Associated with Construction Activity"), the California Department of Transportation (Caltrans) permit issued by the State Board (Order No. 99-06 DWQ, NPDES No. CAS000003), and the MS4 permit issued to Orange County and co-permittees by the Regional Board (Order No. R8-2002-0010, NPDES No. CAS618030). (See also the discussion in the November 17, 2006 TMDL Technical Report, Section 8.3). To implement established TMDLs, these requirements have been or will be revised and/or enforced if and as necessary to implement the TMDLs. Requirements for the implementation, assessment and iterative improvement of Best Management Practices (BMPs) to control sediment discharges have been or will be included in these requirements, where appropriate. In accordance with the established sediment TMDL for Newport Bay and its watershed, sediment control measures are required to be implemented to reduce sediment loading to specified levels. The sediment TMDL allocates the allowable sediment loading capacity among the identified sources. These wasteload and load allocations are implemented through requirements included in waste discharge requirements. The established nutrient TMDL relies on implementation of the sediment TMDL to achieve requisite phosphorus loading reductions (like the organochlorine compounds, phosphorus tends to adsorb to soil particles.) In short, existing waste discharge requirements require or will require the implementation of sediment control measures by responsible parties. As previously noted (Section 2, above), the proposed implementation plan for the organochlorine compounds TMDLs likewise relies to a large extent on the implementation, assessment and iterative improvement of sediment control measures.

It is also important to recognize that there have been and continue to be exceptional efforts by watershed stakeholders on a voluntary basis to address water quality problems affecting Newport Bay and its watershed. In the early 1980's, a comprehensive program was identified to control erosion and sedimentation. The program entails implementation of construction and agricultural BMPs, and construction and maintenance of sediment-trapping basins at key locations in the watershed, in San Diego Creek and in the Upper Bay. The program has been and is being implemented in a coordinated way on a voluntary basis, although the sediment TMDL, established in the late 1990's, includes requirements that reflect and require implementation of the program.

4 Identification of Reasonably Foreseeable Methods of Compliance

As described in Section 1, above, the Substitute Environmental Document for the proposed organochlorine compounds TMDLs for San Diego Creek, Upper Newport Bay and Lower Newport Bay must include an analysis of the reasonably foreseeable methods of compliance with the TMDLs, taking into account a range of environmental, economic and other factors.

An implementation plan is proposed to achieve the TMDLs (see Attachment to Resolution No. R8-2007-0024, 4.b.3), as required by Water Code Section 13242. This implementation plan relies to a large extent on the iterative implementation of effective BMPs to manage the discharge of sediment, particularly fine sediments, given that the principal pathway of organochlorine compound transport in the watershed is the movement of fine soil particles to which these compounds tend to adsorb. These BMPs include both structural and non-structural controls. The implementation plan identifies specific BMP-related responsibilities for specific types of dischargers (urban, agricultural, etc) but also provides the opportunity to develop and implement an integrated approach to address these and other TMDL requirements. Monitoring and special investigations are also proposed to assess compliance with the TMDLs, including the wasteload and load allocations, the efficacy of BMPs, and to provide data necessary to address uncertainties and provide for future refinement of the TMDLs. Again, an integrated approach to monitoring and special investigations for these and other TMDLs for the watershed can be implemented in lieu of organochlorine compound only TMDL actions by individual or groups of dischargers.

As described in Section 3.2, many of the nonstructural and structural controls identified below are already being implemented, at least to some degree, in response to existing permit and/or established TMDL requirements (e.g., the sediment and nutrient TMDLs for Newport Bay and its watershed). Iterative improvements to these BMPs may be necessary to achieve compliance with the proposed organochlorine compounds TMDLs. Compliance with both the

proposed organochlorine compounds TMDLs and other TMDLs, particularly the established sediment TMDL, is likely to be most problematic during large storm events, since most of the sediment and associated pollutants are mobilized and transported during these events. As a practical matter, large-scale BMPs such as detention basins, natural treatment wetlands and, ultimately, dredging of sediments, may be necessary to assure compliance under these circumstances. The implementation and efficacy of these large-scale measures may be limited by technical, economic and environmental factors. As noted in Section 3.1, the watershed is rapidly urbanizing and the availability and very high cost of land are likely to limit opportunities to implement large-scale detention basins or treatment wetlands. These detention basins/wetlands may or may not be technically sufficient to prevent the movement of the fine particulate sediments that are of particular concern with respect to organochlorine compound transport. Dredging of sediments has been necessary in the watershed and the Bay and considerable costs are involved (see economics analysis in November 17, 2006 TMDL technical report, Section 9.0; see also cost information provided by the County of Orange in January 12, 2007 comments on the proposed TMDLs). Indeed, difficulty in raising the requisite funds has resulted in substantial delays in conducting dredging in Newport Bay needed to satisfy sediment TMDL requirements and to protect navigational and other beneficial uses. However, the watershed stakeholders have been exceptionally skilled in obtaining these funds, though, as noted, it frequently takes considerable time. From a technical and environmental perspective, while dredging of sediments is reasonably feasible, there arise questions of the availability of suitable disposal sites and whether removal of sediments results in exposure and mobilization of previously sequestered contaminants adsorbed to buried sediments. The proposed implementation plan includes a task designed to address these issues.

Pursuant to Section 13360 of the California Water Code, the Regional Board cannot dictate which compliance measures responsible agencies must choose to implement the San Diego Creek and Newport Bay organochlorine compounds TMDLs, or which mitigation measures they would employ. The selection and implementation of one or more large-scale BMPs if necessary to achieve compliance with the proposed TMDLs, will require careful consideration of these technical, economic and environmental factors

With that backdrop, the following identifies reasonably foreseeable methods of compliance with the TMDLs required to be identified by Public Resources Code section 21159:

NONSTRUCTURAL CONTROLS

Non-structural controls are generally aimed at controlling the sources of pollutants and usually do not involve construction of new control measures or treatment facilities. As discussed above, these controls are already being utilized in the watershed and any incremental refinement or implementation needed to

address the proposed TMDLs is expected to have no significant environmental impact (see Section 6). Except for monitoring, implementation of these controls as necessary to implement the proposed organochlorine compounds TMDLs should result in nominal additional expenditures by responsible parties. The County of Orange has estimated that the annual monitoring and special study costs to implement the proposed implementation plan alone would be on the order of \$1 million dollars, in contrast to current expenditure by the MS4 permittees of about \$2.3 million dollars for the stormwater program as a whole. It should be noted that the actual figure for monitoring to fulfill the proposed implementation plan would be substantially less than that estimated by the County since the special studies, a significant component of the overall estimate, are encouraged rather than required by the proposed implementation plan. Nevertheless, the significance of the added expenditure is recognized and addressed through provisions in the proposed implementation plan that allow for a phased and integrated TMDL implementation approach. This approach would not necessarily avoid these costs, but implementation of the integrated approach could be used to prioritize or re-direct expenditures over time and to assure overall efficiency in the use of public resources.

In summary, we have no information that the costs of implementing these measures to improve water quality are not financially feasible. Therefore, these are considered reasonably feasible methods of compliance.

1. **Waste Management Facilities:** Develop, implement and inform the public about a collection program for all banned organochlorine pesticides and PCBs. The County of Orange already executes a hazardous waste management and collection program throughout Orange County, which is implemented through their stormwater program. This existing program should be evaluated and enhanced as necessary. This type of program has had demonstrated success in other geographic areas in collecting banned pesticides.
2. **Education and Outreach:** Review and refine the educational/outreach programs that have already been instituted by the construction industry, Caltrans, agriculture and MS4 permittees/stormwater management agencies in response to existing permit and/or TMDL requirements. Education and outreach facilitates the understanding and implementation of appropriate erosion/sediment control practices to prevent offsite migration of sediment and associated pollutants.
3. **Street Maintenance:** Street sweeping is an effective practice to reduce the transfer of sediment from construction sites to streets and gutters. Street sweeping reduces non-point source pollution by five to 30 percent when a conventional mechanical broom and vacuum-assisted wet sweeper is used. The new vacuum assisted dry sweepers are reported to achieve 50-88 percent overall reductions in the annual sediment loading for a residential

street, depending on sweeping frequency. Again, the reduction in sediment load may result in decreased loading of organochlorine compounds to surfaced waters.

4. **Development/Enforcement of Local Ordinances:** The development and enforcement of municipal ordinances that prohibit or limit excessive watering could reduce discharges of sediment and associated organochlorine compounds to surface waters.
5. **Training:** BMP programs to prevent or reduce erosion and offsite migration of sediment are being implemented by dischargers in response to existing permits and/or TMDL requirements. Focused training on the implementation of these BMPs and/or BMPs enhanced to address fine particulates could improve BMP efficacy and reduce the transport to surface waters of sediment and associated pollutants.
6. **Water Conservation:** Practices and programs that limit the amount of sheet water runoff through irrigation controls could effectively reduce the amount of sediment and associated pollutants to surface waters. Such programs could include "intelligent" irrigation systems operated according to climatic needs.
7. **Monitoring:** Monitoring will not result directly in a reduction of sediment and associated pollutant loading to surface waters but must be used to evaluate the effectiveness of non-structural and structural control measures so that the need for improvements can be identified. Regional and site-specific monitoring is being conducted in Newport Bay and its watershed in response to existing permits and/or TMDLs. These programs can be integrated with organochlorine compound monitoring requirements, particularly if the stakeholders elect to pursue an integrated TMDL implementation approach.

STRUCTURAL CONTROLS

1. **Natural Treatment Systems:** The construction and use of natural or artificially created wetland systems would likely retard and/or retain sediments, including the fine particulates to which the organochlorine pollutants adhere. A number of regional treatment systems are either being planned or are already in place in the San Diego Creek watershed.
2. **Vegetated Swales/Buffer Strips:** Construct and maintain vegetative buffers and swales along roadsides and in medians. The replacement of open soil or concreted curb or slope areas with vegetated cover would slow down the runoff velocity, increase stormwater infiltration and could reduce the loading of potentially contaminated fine sediments to surface waters.

3. **Silt Fences/Straw Bales:** These are controls placed in construction areas to control sediment. They are generally temporary measures designed to intercept and slow the flow of sediment-laden sheet flow runoff. Silt fences are comprised of permeable fabric that allows sediment in runoff to settle, which should also help control particulates before water leaves the construction site. Straw bales require lengthy installation. Both types of BMPs are primarily placed along and down slope of exposed, highly erodible areas.
4. **Stormdrain Filters/Inlet Protection:** The discharge of sediment into drainages can be reduced by covering or protecting inlets to stormdrains, and/or using filters within stormdrains. The inlet protectors allow sediment-laden runoff from construction or other types of activities to be detained and/or filtered to allow sediment to settle and be removed prior to discharge into storm drainage systems or watercourses.
5. **Detention Basins/Retention Ponds:** Stormwater flows can be effectively retained through these systems. They also reduce the overall levels of sediment-laden runoff flowing into adjacent waterbodies. They must be appropriately constructed and maintained in order to account for the hydraulic design conditions.
6. **Soil Stabilization:** Various soil stabilization measures, including mulches, binders, and hydroseeding can be effective erosion control measures. They can increase cover, stabilize disturbed soil areas, or protect soils from erosion by wind or water, but are temporary in nature, and more or less reliable to retain the original soil cover depending upon how they are applied and maintained.
7. **Diversion Systems:** Construct diversion systems to capture sediment and non-stormwater runoff. During low flow conditions, runoff may be diverted from storm drain outlets to an on-site detention or treatment system and released back to the creek, or it may be diverted to wastewater collection plants for treatment.
8. **Infiltration Systems:** Install and maintain pavement systems that allow storm water to infiltrate into the ground rather than flow into surface waters, potentially carrying sediment and associated pollutants.
9. **Dredging:** Under extreme storm conditions, BMPs may not be effective in reducing erosion and the transport of sediments that may contain organochlorine compounds and/or other pollutants. In such cases, it may be necessary to physically remove, or sequester (e.g., by capping), accumulated sediments and associated pollutants.

5 Environmental Checklist

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
I. AESTHETICS - Would the project:				
a) Have a substantial adverse effect on a scenic vista?		X		
b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?		X		
c) Substantially degrade the existing visual character or quality of the site and its surroundings?		X		
d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?		X		
II. AGRICULTURE RESOURCES: In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Dept. of Conservation as an optional model to use in assessing impacts on agriculture and farmland. Would the project:				
a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X
b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?				X
c) Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?				X
III. AIR QUALITY - Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:				
a) Conflict with or obstruct implementation of the applicable air quality plan?	X			

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?	X			
c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	X			
d) Expose sensitive receptors to substantial pollutant concentrations?	X			
e) Create objectionable odors affecting a substantial number of people?		X		
IV. BIOLOGICAL RESOURCES - Would the project:				
a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?	X			
b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service?		X		
c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?		X		
d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?		X		
e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?				X
f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation		X		

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
Plan, or other approved local, regional, or state habitat conservation plan?				
V. CULTURAL RESOURCES - Would the project:				
a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?		X		
b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?		X		
c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?		X		
d) Disturb any human remains, including those interred outside of formal cemeteries?		X		
VI. GEOLOGY AND SOILS - Would the project:				
a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:				
i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.				X
ii) Strong seismic ground shaking?				X
iii) Seismic-related ground failure, including liquefaction?				X
iv) Landslides?				X
b) Result in substantial soil erosion or the loss of topsoil?		X		
c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on-site or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?		X		

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?		X		
e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?				X
VII. HAZARDS AND HAZARDOUS MATERIALS - Would the project:				
a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?		X		
b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?			X	
c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				X
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?		X		
f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?		X		
g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?		X		
h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?			X	

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
VIII. HYDROLOGY AND WATER QUALITY - Would the project:				
a) Violate any water quality standards or waste discharge requirements?		X		
b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?			X	
c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on-site or off-site?		X		
d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-site or off-site?		X		
e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?				X
f) Otherwise substantially degrade water quality?		X		
g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X
h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?				X
i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?		X		
j) Inundation by seiche, tsunami, or mudflow?		X		

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
IX. LAND USE AND PLANNING - Would the project:				
a) Physically divide an established community?				X
b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?			X	
c) Conflict with any applicable habitat conservation plan or natural community conservation plan?			X	
X. MINERAL RESOURCES - Would the project:				
a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?		X		
b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?		X		
XI. NOISE - Would the project result in:				
a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	X			
b) Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	X			
c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				X
d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	X			
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise	X			

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
levels?				
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	X			
XII. POPULATION AND HOUSING - Would the project:				
a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				X
b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?				X
c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?				X
XIII. PUBLIC SERVICES				
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services: Fire protection? Police protection? Schools? Parks? Other public facilities?				X
XIV. RECREATION - Would the project:				
a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?			X	
b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect				X

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
on the environment?				
XV. TRANSPORTATION/TRAFFIC - Would the project:				
a) Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?	X			
b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?	X			
c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?				X
d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?		X		
e) Result in inadequate emergency access?				X
f) Result in inadequate parking capacity?			X	
g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?				X
XVI. UTILITIES AND SERVICE SYSTEMS – Would the project:				
a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?			X	
b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause	X			

ENVIRONMENTAL CHECKLIST	Potentially Significant Impact	Less Than Significant With Mitigation Incorporated	Less Than Significant Impact	No Impact
significant environmental effects?				
d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				X
e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				X
f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	X			
g) Comply with federal, state, and local statutes and regulations related to solid waste?				X
XVII. MANDATORY FINDINGS OF SIGNIFICANCE				
a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?	X			
b) Does the project have impacts that are individually limited, but cumulatively considerable? ('Cumulatively considerable' means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?		X		
c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?			X	

6 Discussion of Possible Environmental Impacts of Reasonably Foreseeable Compliance Methods and Mitigation

Section 4 of this SED identified the reasonably foreseeable methods of compliance with the organochlorine compounds TMDLs. The Environmental Checklist, listing the potential adverse environmental impacts associated with these methods and characterizing their significance, is shown in Section 5. This section discusses the Environmental Checklist findings and describes potential mitigation measures and the alternate means of compliance that might be available to reduce or eliminate potentially significant impacts.

A significant effect on the environment is defined in the California Code of Regulations as *"a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including land, air, water, minerals, flora, fauna, ambient noise, and objects of historic or aesthetic significance. A social or economic change by itself shall not be considered a significant effect on the environment. A social or economic change related to a physical change may be considered in determining whether the physical change is significant."*¹⁶ The statute defines a "significant" effect on the environment as *"a substantial, or potentially substantial, adverse change in the environment"*¹⁷, where "Environment" is defined by Public Resources Code section 21060.5 as *"the physical conditions which exist within the area which will be affected by a proposed project, including air, water, minerals, flora, fauna, noise, objects of historic or aesthetic significance."*

In formulating answers to the checklist questions, including the mandatory findings of significance, Regional Board staff evaluated the environmental effects of implementing the non-structural and structural compliance methods identified in Section 4 in the context of the existing environmental and regulatory setting (Section 3). As discussed in Section 3, many, if not all, of the types of structural and non-structural controls that are expected to be needed to achieve compliance with the proposed organochlorine compounds TMDLs are already being implemented, at least to some degree, in response to existing permit and/or other TMDL requirements, and/or on a voluntary basis. The significance of environmental effects was also considered in relation to their severity, including duration and areal extent, and probability of occurrence. Social or economic changes related to a physical change in the environment were also considered in determining whether there would be a significant effect on the environment. However, adverse social and economic impacts alone are not considered significant effects on the environment.

Board staff's review concluded that implementation of the reasonably foreseeable methods of compliance has the potential to result in significant adverse impacts on air quality, noise, transportation/traffic and certain

¹⁶ 14 CCR section 15382

¹⁷ Public Resources Code section 21068

utilities/services (landfills). While these impacts may be reduced or avoided through the implementation of mitigation measures required by the Regional Board and/or local agencies, it may be infeasible to completely mitigate them because mitigation measures are not technically available, economically infeasible, or are otherwise infeasible. The discussion of appropriate mitigation measures in this SED is limited to those measures that meet the regulatory definition of mitigation (CCR Title 14, Chapter 3, Section 15370)¹⁸

- (a) Avoiding the impact altogether by not taking a certain action or parts of an action.
- (b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation.
- (c) Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment.
- (d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action.
- (e) Compensating for the impact by replacing or providing substitute resources or environments.

Pursuant to Section 13360 of the California Water Code, the Regional Board cannot dictate which compliance measures responsible agencies must choose to implement the San Diego Creek and Newport Bay organochlorine compounds TMDLs, or which mitigation measures they would employ. Therefore, the exact types, sizes, and locations of BMPs that might be implemented, in addition to those already in place, to comply with the recommended TMDLs are unknown. This analysis considers a range of non-structural and structural BMPs that might be used, but is by no means an exhaustive list of available BMPs. Once the implementing agency (-ies) (responsible agency, -ies) decides upon and selects BMPs, a project-level and site-specific CEQA analysis may be required from the responsible agency.¹⁹ As stated in Section 1, the Regional Board intends this analysis to serve as a Tier One environmental review.

¹⁸ Section 21083, Public Resources Code; Reference: Sections 21002, 21002.1, 21081, and 21100(c), Public Resources Code.

¹⁹ Title 14, CCR, Chapter 3, 15184(b). If a local agency undertakes a project to implement a rule or regulation imposed by a certified state environmental regulatory program listed in Section 15251, the project shall be exempt from CEQA with regard to the significant effects analyzed in the document prepared by the state agency as a substitute for an EIR. The local agency shall comply with CEQA with regard to any site-specific effect of the project which was not analyzed by the certified state agency as a significant effect on the environment. The local agency need not re-examine the general environmental effects of the state rule or regulation. Authority cited: Section 21083, Public Resources Code; Reference: Sections 21080, 21080.5, and 21154, Public Resources Code.

During dry weather, effective implementation of the BMPs already employed in the watershed is expected to be largely successful in preventing organochlorine loading to surface waters, since it is normally practical to retain small flows on-site. That said however, the efficacy of the existing BMPs in preventing organochlorine compound transport is not known and monitoring is required. Iterative improvement of these BMPs, at least at some locations, may be necessary. This may entail changes in design, size, location or type (e.g., the added use of polyacrylamide to increase soil infiltration and flocculation of suspended sediments).

Because large-scale erosion and sedimentation primarily occurs during high flow storm events, these traditional BMPs may have limited success in reducing/eliminating the discharge of potentially-contaminated sediments to receiving waters during wet weather. As stated in Section 4, as a practical matter, large-scale BMPs such as detention basins, engineered treatment wetlands and, ultimately, dredging of sediments, may be necessary to assure compliance under these circumstances. Also as described in Section 4, it may be infeasible to implement large-scale detention basins or engineered treatment wetlands due to land availability and cost constraints.

The findings identified in the checklist relate to the potential implementation of more advanced BMPs, the construction of sediment detention basins/engineered treatment wetlands, and in-creek or in-bay dredging. It may be noted that the stakeholders in the Newport Bay watershed already have extensive experience and expertise with dredging, detention basin and natural treatment system construction and operation (e.g., periodic dredging of Newport Bay and implementation of sediment detention basins in the watershed and San Diego Creek, as well as natural treatment wetland systems) through the ongoing coordinated implementation, on a voluntary basis, of a comprehensive erosion/sedimentation control plan for the watershed (See Section 3).

Environmental Checklist Answers

I. AESTHETICS

Will the project ...

I. Aesthetics a) Have a substantial adverse effect on a scenic vista?

Answer: Less Than Significant With Mitigation Incorporated

Impact Discussion: Compliance with the OCs TMDLs, wasteload allocations, and load allocations (WLAs/LAs) is expected to be achieved through the effective implementation of a combination of non-structural and structural best

management practices (BMPs) to reduce erosion and the transport of fine sediment and associated pollutants. The proposed TMDL implementation plan relies to a large extent on the iterative implementation of such BMPs to augment pollutant reductions expected to occur through natural attenuation of the organochlorine compounds.

Both structural and non-structural BMPs, including sediment detention basins and engineered treatment wetlands, are already being implemented in the watershed in response to existing Regional Board/State Board permit and/or other TMDL requirements, and/or on a voluntary basis. While improvements may be necessary to address fine particulates, these BMPs are expected to be highly effective during dry weather and most rain events. However, most transport of sediment, including the finer particles to which the OCs tend to adsorb, generally occurs during extreme weather conditions such as catastrophic storm events. During such events, small-scale structural and nonstructural BMPs would likely be ineffective, requiring reliance upon larger-scale detention basins or engineered treatment systems, where feasible. As already noted, the lack of available land in the watershed and its very high cost will likely limit opportunities for installation of such systems, except at a relatively small scale. Dredging of transported sediment may prove necessary to prevent adverse water quality and beneficial use impacts. Again, existing TMDL and/or permit requirements may necessitate the implementation of larger-scale measures, apart from the requirements of the proposed TMDLs.

The implementation of non-structural BMPs is not expected to result in the obstruction of any scenic vista or view open to the public because these BMPs do not involve physical alterations that could affect the scenic environment. Iterative improvements to existing BMPs to address fine particulates (e.g., the addition of chemical coagulants), at least during dry weather, are not expected to be of the type or scale that would physically alter a scenic vista.

Implementation of large-scale detention basins, natural treatment wetlands or dredging activities to address sediment transport/removal as the result of large storms could affect scenic vistas, depending, obviously, on their location. Heavy machinery, stockpile areas and the like would likely be associated with construction of basins or wetlands and with dredging activities, particularly in the Bay, and could cause adverse visual impacts. However, these impacts would be temporary. Once construction/dredging activities are complete, the detention basins/wetlands and dredged areas may in fact result in improvements in the visual character of the surroundings, including scenic views.

Mitigation: In the unlikely event that the dischargers install facilities on a scale that could obstruct scenic views, such impacts could be reduced or eliminated with appropriate planning, design, and siting of the structural BMPs, in coordination with local agency plans and planning programs. Vegetative or other buffers could be used to mitigate any adverse effects of the selected BMPs on

the visual character of the BMP sites and their surroundings. Additionally, many structural BMPs can, if necessary, be constructed underground to eliminate aesthetic issues. Temporary impacts resulting from the use of heavy equipment, stockpile areas and other construction-related activities can be minimized by proper siting, timing to reduce or avoid periods of high public exposure, and the use of vegetative or other buffers. Such mitigation measures can and should be required by local lead and responsible agencies through their project-specific CEQA and/or planning processes.

I. Aesthetics b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?

Answer: Less Than Significant With Mitigation Incorporated

Impact Discussion: See discussion 1.a., above. Implementation of large-scale BMPs and/or dredging activities has the potential to adversely affect scenic resources, if not properly planned, sited and designed. It is unlikely that compliance with the proposed TMDLs will rely upon the construction of large facilities such as detention basins that could substantially damage scenic resources, other than on a temporary basis during construction/dredging. Over the long-term, implementation of these BMPs may enhance scenic resources. This is particularly true for dredging activities in Newport Bay, where the removal of sediment in specific areas restores and enhances habitats of various kinds, generally contributing to improved aesthetics and opportunities to observe wildlife. Continued usage of existing BMPs managing the discharge of sediment offsite should not damage any scenic resources.

Mitigation: See 1.a., above

I. Aesthetics c) Substantially degrade the existing visual character or quality of the site and its surroundings?

Answer: Less Than Significant With Mitigation Incorporated

Impact Discussion: See I. Aesthetics a) above.

Mitigation: See I. Aesthetics a) above.

I. Aesthetics d) Create a new source of substantial light or glare that would adversely affect day or nighttime views in the area?

Answer: Less Than Significant With Mitigation Incorporated

Impact Discussion: None of the non-structural BMPs identified in Section 4 would result in substantial physical changes to the environment, including light or glare that would affect aesthetics. The construction and installation of structural BMPs could be performed during evening or night time hours, though this is unlikely for practical reasons. If this were to occur, night time lighting would be required to perform the work. Also, lighting could possibly be used to increase safety around structural BMPs.

Mitigation: In the unlikely event that construction is performed during night time hours, a lighting plan can be implemented that includes shielding on all light fixtures, and directional lighting methods to limit the glow of lights and glare. Vegetative or other types of screening may be used. If and where additional lighting is necessary for safety purposes once construction of BMPs is complete, the lighting plan might entail low intensity lighting and/or rotational timing of lighting fixtures. Such mitigation measures can and should be required by local lead and responsible agencies through their project-specific CEQA and/or planning processes.

II. AGRICULTURE RESOURCES

Will the project ...

II. Agriculture Resources a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?

Answer: No Impact

Impact Discussion: The implementation of the proposed Basin Plan amendment will not foreseeably result in changes to present land uses, including prime, unique or important farmland. The current structural BMPs used to manage or control runoff from the watershed are placed such that they do not impede the use of land for farming. If new BMPs are required, they can be sited or sized such that farmland is not impacted.

Implementation of the proposed TMDLs would necessitate expenditures to address monitoring and BMP requirements, and these added costs could provide impetus for conversion of agricultural lands to urban or other uses. However, as noted in Section 1.1.1 of the OCs TMDLs Technical Report, as of the year 2002, agriculture accounted for only approximately five percent of land use in the San Diego Creek/Newport Bay watershed. The amount of land in the watershed used for agriculture continues to diminish rapidly in response to urban development pressure. The majority of the areas in agricultural or farm use in the watershed are under lease from private landowners who have, and, in many

cases are implementing, long term urban and residential development plans. These development interests significantly outweigh any potential impetus for land conversion that might be provided by the proposed TMDLs, or those TMDLs already established for the watershed.

Mitigation: No mitigation is necessary.

II. Agriculture Resources b) Conflict with existing zoning for agricultural use, or a Williamson Act contract?

Answer: No Impact

Impact Discussion: See II. Agriculture Resources a) above.

Mitigation: See II. Agriculture Resources a) above.

II. Agriculture Resources c) Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland, to non-agricultural use?

Answer: No impact.

Impact Discussion: See II. Agriculture Resources a) above.

Mitigation: See II. Agriculture Resources a) above.

III. AIR QUALITY

Will the project...

III. Air Quality a) Conflict with or obstruct implementation of the applicable air quality plan?

Answer: Potentially Significant Impact

Impact Discussion: The non-structural BMPs identified in Section 4 include street sweeping, which is already conducted in the watershed in response to existing permit requirements. Substantial increases in this activity, if pursued by the responsible parties in response to the proposed TMDLs, would likely result in increases in vehicle emissions that could have potentially significant, if periodic and temporary, effects on air quality and implementation of the air quality plan for the South Coast Basin.

Air quality impacts that may affect implementation of the air quality plan are likely to result during construction of large-scale structural BMPs and/or dredging. These impacts would result from increased vehicular traffic (including the transport of personnel and equipment to and from the construction/dredging site) and use of heavy equipment associated with construction activities and the removal and disposal of sediment/dredge spoils. These impacts would be temporary but potentially significant, even if equipment/vehicles with emission controls are employed and properly maintained. Once construction is complete, there may be short-term periods of increased equipment/vehicular activity associated with maintenance of installed facilities. In addition, the generation of visible emissions, fugitive dust and particulate matter during construction or maintenance activities could also impact ambient air quality.

Mitigation: Impacts may be reduced but likely not below a level of significance completely avoided through the use of mitigation measures that can and should be required by local lead or responsible agencies through their CEQA and/or planning processes. These include low-emission vehicles/equipment, use of soot reduction traps/diesel particulate filters, use of emulsified diesel fuel, use of vacuum-assisted street sweepers to minimize particulate suspension, design of BMPs to minimize the need for maintenance, and proper vehicle maintenance. Fugitive dust and aerial suspension of particulate matter can be reduced by standard construction methods, such as moisture control measures.

III. Air Quality b) Violate any air quality standard or contribute substantially to an existing or projected air quality violation?

Answer: Potentially Significant Impact

Impact Discussion: See III. Air Quality a). above. The watershed is within the South Coast Basin of the AQMD, which is non-attainment due to particulate matter (10 and 2.5 microns) and ozone. The air quality impacts described in "a", above would contribute to non-attainment.

Mitigation: See III. Air Quality a). above.

III. Air Quality c) Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?

Answer: Potentially Significant Impact

Impact Discussion: See III. Air Quality a) and b) above. The air quality impacts described in "a", above, would likely result in a cumulatively significant net

increase of air pollutants, given the existing non-attainment status of the watershed area.

Mitigation: See III. Air Quality a) and b) above.

III. Air Quality d) Expose sensitive receptors to substantial pollutant concentrations?

Answer: Potentially Significant Impact

Impact Discussion: See III. Air Quality a) above.

Mitigation: See III. Air Quality a) above.

III. Air Quality e) Create objectionable odors affecting a substantial number of people?

Answer: Less Than Significant With Mitigation Incorporated

Impact Discussion: Noxious odors can result from the exhaust from vehicles and equipment used to construct/maintain structural BMPs, and from street sweepers. Such impacts are of short duration in localized areas but cumulatively may nevertheless affect a large number of people over time. Excavation needed for construction and/or dredging activities may expose soils/sediments with noxious odors (e.g., sulfides). Stagnant water left at construction sites may also result in noxious odors.

Mitigation: Use of low emission vehicles/equipment and proper maintenance of vehicles/equipment should reduce noxious emissions. Objectionable odors from engine exhaust would be temporary, and should dissipate once the vehicle has passed through the area.

Structural BMPs should be properly designed to eliminate or minimize standing or pooled water, and installed in isolated locations to maximize the distance to sensitive receptors should stagnation occur. Mitigation measures to eliminate odors from structural BMPs include: 1) regular inspections to ensure that water does not pool and become stagnant; 2), utilize covers, filters, or barriers to prevent the escape of odors; 3), install and operate aeration devices; and, 4) use odor suppressing chemical additives. During maintenance, odorous sources should be uncovered for as short a time period as possible. It may be feasible to schedule construction/maintenance/dredging activities during periods when there are fewer people in the area.

These mitigation measures can and should be required by local lead or responsible agencies through their CEQA and/or planning processes

IV. BIOLOGICAL RESOURCES

Will the project...

IV. Biological Resources a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service?

Answer: Potentially Significant

Impact Discussion: None of the non-structural BMPs identified in Section 4 would result in physical changes to the environment that would significantly adversely affect biological resources, including listed or candidate species and their habitats. Non-structural BMPs such as measures to reduce nuisance flows to surface waters, including water conservation measures, are expected to result in changes in hydrology that may affect habitats and the species utilizing them. Such measures are already being implemented in the watershed, in part in response to existing permit requirements (e.g., MS4). Any changes to these non-structural measures implemented by the responsible agencies in response to the proposed TMDLs would not have a substantial incremental environmental effect.

Construction of detention basins and natural treatment wetlands, and dredging activities, if pursued by the stakeholders to comply with the proposed TMDLs, have the potential to adversely affect biological resources, including candidate, sensitive, or special species, riparian and wetland habitats and the movement of fish and wildlife.

Impacts could, and, in the case of large-scale dredging, are likely to include: mortality resulting from construction or other human-related activity; the direct loss or modification of occupied habitat, including nest/den sites; and, impairment of essential behavioral activities, such as breeding, resting and feeding due to habitat loss/modification and/or increased human disturbance, including increased noise or light.

Mitigation: Measures can be implemented (and have already been successfully implemented in this watershed) to mitigate these impacts to levels that are less than significant. Specific projects would be subject to requirements for avoidance and mitigation imposed by the California Department of Fish and Game and, in cases involving federally-listed species, the U.S. Fish and Wildlife Service. These requirements include: pre-construction surveys to determine species and habitat presence and the need for mitigation; incorporation of buffer areas in project

design; project timing restrictions to avoid sensitive species presence and nesting activities; and impact avoidance by use of alternative locations and/or design features. These agencies have also approved mitigation for site-specific project impacts at alternative locations in support of habitat and species conservation plans and goals for the watershed as a whole.

Dredging activities are particularly likely to result in significant adverse impacts on biological resources. Again, specific projects would be reviewed and approved by the Department of Fish and Game, U.S. Fish and Wildlife Service and the Regional Board (for consideration of Clean Water Act Section 401 water quality standards certification (in most cases) and regulation under waste discharge requirements). These agencies would disallow or require modification of projects that would result in significant, unmitigable adverse biological impacts. There is extensive experience in this watershed with CEQA-compliance, permitting and implementation of large-scale dredging projects, both in the Bay and in San Diego Creek. Dredging in the Bay has been carefully coordinated with the Department of Fish and Game and U.S. Fish and Wildlife Service to achieve biological restoration and protection goals for the Upper Newport Bay Ecological Reserve. There is no reason to suppose that such advantageous coordination could not be accomplished elsewhere in the watershed in conjunction with large scale detention basin/wetlands treatment system construction and operations. Over the long-term, sound planning and implementation of dredging and other BMP projects in accordance with requirements imposed by the Department of Fish and Game, the U.S. Fish and Wildlife Service and the Regional Board is expected to support implementation of habitat and species conservation plans, resulting in enhanced protection and restoration of biological resources in the watershed as a whole.

Since the locations of potential BMPs that will be implemented to comply with the TMDLs are currently unknown and cannot be dictated by the Regional Board, these site-specific measures cannot be identified or analyzed in this document.

Also, prior to approving these TMDLs, USEPA must consult with the US Fish and Wildlife Service (USFWS), pursuant to Section 7 of the Endangered Species Act, in order to ensure that the TMDLs will not jeopardize any federally listed species. Regional Board consultation will also occur with the California Department of Fish and Game to ensure that the TMDLs will be in compliance with the California Endangered Species Act (CESA). Consultation with trustee agencies, and implementation of mitigation measures they identify, will ensure that the TMDLs will not cause any significant adverse impacts to biological resources.

When specific projects are designed and their sites are identified, a focused protocol animal survey and/or a search of the California Natural Diversity Database should be performed to confirm that any potentially special-status animal species in the site area are properly identified such that site-specific protection measures can be developed as necessary.

In sensitive habitat areas with unique, rare or endangered species, responsible agencies will be required to consider the implementation of non-structural BMPs, such as developing and enforcing ordinances, and/or low impact structural BMPs that can be retrofitted into existing facilities to minimize biological resource impacts.

IV. Biological Resources b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations, or by the California Department of Fish and Game or US Fish and Wildlife Service?

Answer: Less Than Significant With Mitigation Incorporated

Impact Discussion: See IV. Biological Resources a) above.

Mitigation: See IV. Biological Resources a) above.

IV. Biological Resources c) Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?

Answer: Less Than Significant With Mitigation Incorporated

Impact Discussion: Non-structural BMPs, such as the creation and enforcement of ordinances to eliminate nuisance flows, or the use of water conservation practices, are currently practiced in the Newport watershed, at least in part in response to existing permit (e.g., MS4) requirements. The consequent reduction of nuisance flows to surface waters in the watershed could result in changes to wetland hydrology and the diversity or number of any species of plants and animals. The effects of any changes in existing implementation of these non-structural BMPs, if implemented by the responsible parties in response to the proposed TMDLs, are expected to be insignificant.

Dredging and the installation of structural BMPs such as detention basins or engineered wetlands treatment systems could affect existing wetlands at the site by direct removal or filling. The construction and operation of detention basins and wetlands treatment systems could cause changes in hydrology in adjacent surface waters that would affect the establishment of wetlands elsewhere, or the health and maintenance of existing wetlands. However, it is more likely that these structural controls could be designed and implemented so as to provide a net increase in available wetland and/or open water habitat. Typically, engineered wetlands systems are designed for this very purpose.

Mitigation: Potential impacts to wetlands can be mitigated by proper siting, design and implementation so as to avoid or minimize impacts on wetlands. Design measures can be employed to reduce or eliminate changes in hydrology that would affect the establishment and maintenance of wetlands. Where dredging activities would directly impact existing or potential wetlands, mitigation at alternative sites would need to be identified and implemented in concert with the biological resource agencies. See IV. Biological Resources a), above.

IV. Biological Resources d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?

Answer: Less Than Significant With Mitigation Incorporated

Impact Discussion: See IV. Biological Resources a) and c) above. The implementation of detention basins or engineered wetlands could affect the movement of fish species by changing local stream hydrology and/or by imposing physical barriers. Depending on their size, location and design, these structural measures could also impose physical barriers on the movement of wildlife along wildlife corridors. Changes in stream courses resulting from modified hydrology and/or physical barriers could affect spawning and nursery areas. Dredging activities could result in physical removal or substantial alteration of spawning and nursery sites.

Mitigation: See IV. Biological Resources a) and c) above. Potential impacts to fish and wildlife movement and nursery sites can be mitigated by proper siting, design and implementation. Design measures that would assure maintenance of minimum flows in adjacent surface waters can be employed to reduce or eliminate changes in hydrology that would affect fish movement. To the extent that physical barriers arise with the implementation of these measures, alternative travel corridors/maintenance of minimum low flow channels can be incorporated in project design. Where dredging activities would directly impact existing or potential nursery sites, mitigation at alternative sites would need to be identified and implemented in concert with the biological resource agencies.

IV. Biological Resources e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?

Answer: No Impact

Impact Discussion: Neither non-structural nor structural BMPs, including the construction, implementation or maintenance of detention basins, natural

treatment systems, and/or dredging, should conflict with local policies or ordinances. If and as conflicts arise as specific projects are proposed, the projects would need to be redesigned to conform to the local policies or ordinances, unless variances, if available, are obtained.

Since the locations of potential BMPs that will be implemented to comply with the TMDLs are currently unknown and cannot be dictated by the Regional Board, the potential for such conflicts to arise is too speculative to consider in detail in this document.

Mitigation: None necessary.

IV. Biological Resources f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan?

Answer: Less Than Significant Impact with Mitigation Incorporation

Impact Discussion: See IV. Biological Resources a) above. Part of the San Diego Creek watershed is within the planning area for the Central/Coastal Natural Community Conservation Plan (NCCP) and Habitat Conservation Plan (HCP), managed by the Nature Reserve of Orange County, a non-profit organization. As described previously, BMP implementation can be planned, designed and coordinated so as to enhance habitat and natural community plans provided that the BMP will not result in negative impacts to habitat and wildlife preservation goals outlined by the plan. BMPs could potentially become key features of these plans, provided that their design and implementation is coordinated with the habitat and wildlife preservation goals, and that their purpose, construction, operation and maintenance does not conflict with other uses in the area. However, since the NCCP/HCP lands are generally located upgradient and outside of developed lands in the watershed, it is unlikely that they would be used to site BMPs that would implement the TMDLs since there are no expected sources of organochlorine compounds in these areas.

Mitigation: See IV. Biological Resources a) above.

V. CULTURAL RESOURCES

Will the project...

V. Cultural Resources a) Cause a substantial adverse change in the significance of a historical resource as defined in §15064.5?

V. Cultural Resources b) Cause a substantial adverse change in the significance of an archaeological resource pursuant to §15064.5?

V. Cultural Resources c) Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?

V. Cultural Resources d) Disturb any human remains, including those interred outside of formal cemeteries?

Answer (a, b, c and d): Less than Significant with Mitigation Incorporation.

Impact Discussion: The implementation of non-structural BMPs would not result in physical changes that would affect the significance of an historical, archaeological or paleontological resource, or a unique geological feature, or result in the disturbance of human remains.

The construction of structural BMPs has the potential to significantly affect these resources through direct destruction or substantial disturbance as the result of earth –moving or other construction-related activities.

Mitigation: Local agencies can and should require site-relocation and/or alternative project design/implementation to mitigate these potential impacts.

VI. GEOLOGY AND SOILS

Will the project...

VI. Geology and Soils a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving i) Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.

VI. Geology and Soils a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving ii) Strong seismic ground shaking?

VI. Geology and Soils a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving iii) Seismic-related ground failure, including liquefaction?

VI. Geology and Soils a) Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving iv) Landslides?

Answer: No Impact

Impact Discussion: None of the reasonably foreseeable structural and nonstructural BMPs identified in Section 4 would result in physical changes in the environment that could or would occasion the subject impacts. To the extent that project-specific analysis identifies any such impacts, suitable mitigation

measures must be identified and implemented, such as selection of an alternative location or design, or implementation of an alternative BMP(s).

Mitigation: None necessary.

VI. Geology and Soils b) Result in substantial soil erosion or the loss of topsoil?

Answer: Less Than Significant With Mitigation Incorporated

Impact Discussion: Non-structural BMPs would not result in the substantial increase of water erosion of soils or the loss of topsoil because none of the non-structural BMPs would result in increased discharges to the MS4 system, or in substantially exposing soils to erosion by wind and water. Reductions in surface water flows that may result from the implementation of water conservation and nuisance flow reduction measures may expose stream bed sediments to erosion. However, the effects of any changes in existing implementation of these non-structural BMPs, if implemented by the responsible parties in response to the proposed TMDLs, are expected to be insignificant.

Depending on the structural controls or BMPs selected, soil excavation and grading may be necessary during construction of new structures, creating the potential for wind or water erosion of soil/topsoil. Such impacts should be short-term and occur only during construction.

Mitigation: Construction sites are currently required to implement sediment control measures pursuant to existing permit requirements (MS4, general construction permit) and local agency requirements established to implement permit requirements. Pursuant to these requirements, best management practices must be used during implementation to minimize the potential for erosion and offsite sediment runoff. These BMPs may include the diversion of stormwater or reduction of runoff flow velocity from some sites.

VI. Geology and Soils c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on-site or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?

Answer: Less Than Significant With Mitigation Incorporated

Impact Discussion: Neither current nor reasonably foreseeable nonstructural BMPs would be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project because the controls would not involve new movement of soil or changes to the geologic structure.

It is theoretically possible that detention basins/engineered treatment wetlands could be implemented at a scale and/or located where the infiltration of water retained in the facilities could cause high groundwater table elevations and unstable geologic conditions, potentially resulting in on-site or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.

Mitigation: The potential for these impacts can be reduced or eliminated by proper siting, engineering design and operation or by the selection of alternative BMPs. Structures should not be located in unstable geologic areas or where loose or compressible soils are present. Infiltration type BMPs could be sited away from areas with loose or compressible soils, and away from slopes that could become destabilized by an increase in groundwater flow. If necessary, detention basins could be designed to be located in areas that have clay soils to decrease the infiltration of water. Adverse impacts could also be avoided through proper geotechnical investigations, siting, design, and ground and groundwater level monitoring to ensure that structural BMPs are not employed in areas subject to unstable soil conditions to mitigate potential impacts to a less than significant level.

VI. Geology and Soils d) Be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?

Answer: Less than Significant Impact with Mitigation Incorporation

Impact Discussion: See the response to VI. Geology and Soils c) above.

Mitigation: See the response to VI. Geology and Soils c) above.

VI. Geology and Soils e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?

Answer: No Impact

Impact Discussion: Implementation of the proposed TMDLs will not result in physical changes to the environment relevant to the suitability of subsurface or alternative waste water disposal systems. In any case, sewers are available in the watershed.

Mitigation: None necessary.

VII. HAZARDS AND HAZARDOUS MATERIALS

Will the project...

VII. Hazards and Hazardous Materials a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?

Answer: Less Than Significant Impact with Mitigation Incorporated.

Impact Discussion: The reasonably foreseeable non-structural and structural BMPs included in this evaluation would not, for the most part, require the routine transport, use, or disposal of hazardous materials. A foreseeable exception is the implementation of collection program(s) for remnant organochlorine compound stocks. However, such collection programs are already being implemented successfully in the watershed and any improvements necessary to address the proposed TMDLs should not have a significant incremental environmental effect. Excavation necessary to construct detention basins or engineered wetlands and/or dredging activities may result in the exposure of hazardous soils or other materials and the need to properly remediate and/or dispose of these materials. This situation is not expected to be routine but limited to construction/dredging at specific sites for the duration of the activity.

Mitigation: Potential hazards associated with collection programs can be mitigated with proper handling, storage and disposal procedures already utilized in the watershed. Pre-project site characterization is already and can continue to be used to identify the potential for discovery of hazardous soils/materials as detention basins/engineered wetlands are constructed or dredging is conducted. The results of these characterizations can be used to identify or determine the need for project alternatives, including the selection of alternative sites and project designs that would avoid or minimize the exposure of hazardous materials. Remediation/disposal plans have been and can continue to be identified to minimize public and environmental exposure to these materials.

VII. Hazards and Hazardous Materials b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?

Answer: Less Than Significant Impact.

Impact Discussion: See VII. Hazards and Hazardous Materials a) above.

Mitigation: See VII. Hazards and Hazardous Materials a) above.

VII. Hazards and Hazardous Materials c) Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?

Answer: No Impact

Impact Discussion: See VII. Hazards and Hazardous Materials a) above. The reasonably foreseeable methods of compliance with the proposed TMDLs would not necessitate hazardous emissions or handling of hazardous substances within the proximity of a school.

Mitigation: None necessary.

VII. Hazards and Hazardous Materials d) Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?

Answer: No Impact

Impact Discussion: It is not reasonably foreseeable that the implementation of the TMDLs will require use of a site location that is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5. TMDL implementation may entail implementation of BMPs at former U.S. Marine bases, however, these sites are and have been subject to remediation to address hazardous waste contamination.

Mitigation: None necessary.

VII. Hazards and Hazardous Materials e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area?

Answer: Less Than Significant Impact with Mitigation.

Impact Discussion: See XIV. Transportation/Traffic d), below.

Mitigation: See XIV. Transportation/Traffic d), below.

VII. Hazards and Hazardous Materials f) For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?

Answer: Less Than Significant Impact with Mitigation.

Impact Discussion: See XIV. Transportation/Traffic d), below.

Mitigation: See XIV. Transportation/Traffic d), below.

VII. Hazards and Hazardous Materials g) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?

Answer: Less Than Significant Impact with Mitigation.

Impact Discussion: There is a slight possibility that structural BMPs may significantly impact the implementation of an adopted emergency response or evacuation plan. During the construction activities, the equipment could impede emergency evacuation or response plans by obstructing the movement of people or blocking the progress of emergency equipment. To the extent that implementation of any of the reasonably foreseeable BMPs would result in traffic hazards (see XIV. Transportation/Traffic d), below) or extend travel time, the implementation of an emergency response plan could be adversely affected. Since the locations of potential BMPs that will be implemented to comply with the TMDLs are currently unknown and cannot be dictated by the Regional Board, the likelihood or extent of such an impact can only be speculated.

Mitigation: During construction activities, responsible agencies could insure that storage areas are set aside for machinery. Specific parking areas could be created for earth-moving machines and other equipment. Temporary streets should be established to insure the flow of vehicles is not obstructed. Safety programs such as training in emergency evacuation procedures could be taught and practiced during routine work periods. See also XIV. Transportation/Traffic d), below.

VII. Hazards and Hazardous Materials h) Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?

Answer: Less than significant.

Impact Discussion: It is not reasonably foreseeable that the implementation of detention basins, engineered wetlands or dredging activities would have a significant effect on the potential for fire loss. The construction of engineered wetlands may result in the growth of vegetation in urban areas, including

residential areas. However, implementation of appropriate vegetation management protocols should prevent a fire hazard.

Mitigation: None necessary.

VIII. HYDROLOGY AND WATER QUALITY

Will the project...

VIII. Hydrology and Water Quality a) Violate any water quality standards or waste discharge requirements?

Answer: Less Than Significant With Mitigation Incorporated

Impact Discussion: The purpose of the implementation of the proposed TMDLs is to improve quality conditions in San Diego Creek and its tributaries, and within Upper and Lower Newport Bay, such that water quality standards are attained. Over the long-term, implementation of the TMDLs is expected to result in improved water quality conditions and the restoration and protection of water quality standards.

During construction and maintenance of structural BMPs, there may be short-term reductions in water quality that result from the wind or water erosion of soils and the transport of these soils, which may contain organochlorine or other pollutants, to surface waters. As discussed in Section 4, dredging activities, particularly large-scale dredging such as has occurred in Newport Bay, are likely to result in temporary re-suspension of sediments, resulting in adverse increases in turbidity, reduction in light transmission, and the potential for mobilization of pollutants, including the organochlorine compounds, adsorbed to the sediments. Dredging operations are conducted in accordance with waste discharge requirements issued by the Regional Board that require the implementation of operational controls, such as silt curtains, that limit the spatial extent of these adverse impacts. Failure to implement the waste discharge requirements can lead to adverse impacts on water quality standards, and, obviously, violations of the requirements. These impacts are of short-duration and limited in scope, provided that the operations are conducted properly and efficiently. As a practical matter, consistent compliance with these waste discharge requirements may be difficult for the large-scale dredging activities in Newport Bay, leading to violations of turbidity standards and waste discharge limits based on those standards. However, compliance can be achieved most of the time through diligent operation of the dredge facilities. Adverse impacts associated with infrequent and temporary violations of the requirements are not expected to result in significant impairment of water quality or beneficial uses.

The use of nonstructural controls such as water conservation or local ordinances may result in the reduction of nuisance flows during dry weather (see impact discussion under IV. Biological Resources c) above). The reduction of nuisance flows could result in the reduction of the volume of overall flow within San Diego Creek and its tributaries during dry weather. The reduction may cause an increase in the temperature of instream flows and a decrease in dissolved oxygen in the pools and riffles, changing the ecological characteristics of affected surface waters, with consequent changes in species composition and abundance. Beneficial uses, including wildlife and aquatic uses, groundwater recharge, and recreation, could be adversely affected. However, these non-structural BMPs are already being implemented in the watershed. Any changes to these non-structural measures implemented by the responsible agencies in response to the proposed TMDLs would not have a substantial incremental environmental effect.

Mitigation: Changes in water quality as the result of construction and maintenance of detention basins/engineered wetlands can be avoided or reduced by implementation of now standard BMPs (e.g., silt fences, installation of small-scale retention basins, construction of swales, use of chemical flocculating agents such as polyacrylamide monomer (PAM) to hold sediment in place designed to prevent erosion and off-site migration of sediment and any associated pollutants to surface waters. Dredging operations conducted in accordance with established waste discharge requirements, which require the implementation of suitable BMPs (e.g., silt curtains), should not result in significant adverse impacts on water quality standards.

VIII. Hydrology and Water Quality b) Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?

Answer: Less Than Significant

Impact Discussion: As discussed in VIII. Hydrology and Water Quality a) above, certain non-structural BMPs (water conservation, nuisance flow reduction measures) are intended to decrease surface water flows, which would affect the amount of water available for groundwater recharge. These measures are already being implemented in the watershed. Any changes to these non-structural measures implemented by the responsible agencies in response to the proposed TMDLs would not have a substantial incremental environmental effect.

The implementation of detention basins or engineered wetlands may increase groundwater recharge as the result of the purposeful retention of surface flows,

allowing more time for infiltration of these flows into underlying aquifers. Depending upon the location of these BMPs, there may be a change in recharge locations. However, the net effect is expected to be an increase in recharge in the groundwater management zone as a whole.

Mitigation: None necessary.

VIII. Hydrology and Water Quality c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in substantial erosion or siltation on-site or off-site?

Answer: Less Than Significant With Mitigation Incorporated

Impact Discussion: Implementation of detention basins/engineered wetlands would result in, or may require, changes to surface water drainage patterns. Detention basins would be constructed purposefully to interrupt surface water flows, and, depending on their location, may require or result in surface water diversion. Similarly, engineered wetlands may require surface water diversion to provide a source of water and are expected to retain water, at least long enough to provide desired treatment. However, none of these hydrological changes should result in substantial erosion or siltation either on or off site, provided that the facilities are properly designed, constructed and operated, and provided that standard erosion control practices are employed as necessary.

Mitigation: Proper siting, design and operation of structural BMPs and use of standard erosion and siltation control practices should avoid or minimize the subject impacts to less than significant levels.

VIII. Hydrology and Water Quality d) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding on-site or off-site?

Answer: Less Than Significant With Mitigation Incorporated

Impact Discussion: See response to VIII. Hydrology and Water Quality c) above.

Mitigation: See response to VIII. Hydrology and Water Quality c) above.

VIII. Hydrology and Water Quality e) Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff?

Answer: No impact.

Impact Discussion: Detention basins/engineered wetlands used to comply with the proposed TMDLs are intended to retain water to allow sediment settling and/or pollutant treatment to improve water quality conditions and would not create new sources of water runoff.

Mitigation: None necessary.

VIII. Hydrology and Water Quality f) Otherwise substantially degrade water quality?

Answer: Less Than Significant With Mitigation Incorporated

Impact Discussion: See response to VIII. Hydrology and Water Quality a).

Mitigation: See response to VIII. Hydrology and Water Quality a).

VIII. Hydrology and Water Quality g) Place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?

Answer: No impact.

Impact Discussion: No reasonably foreseeable effects of the proposed TMDLs on housing in 100-year flood hazard areas are known. Since the locations of potential BMPs that will be implemented to comply with the TMDLs are currently unknown and cannot be dictated by the Regional Board, the likelihood or extent of such an impact could only be speculated.

Mitigation: None necessary.

VIII. Hydrology and Water Quality h) Place within a 100-year flood hazard area structures that would impede or redirect flood flows?

Answer: No Impact

Impact Discussion: Since the locations of potential BMP implementation to comply with the TMDLs are currently unknown and cannot be dictated by the Regional Board, the likelihood or extent of such an impact could only be speculated.

Mitigation: None necessary.

VIII. Hydrology and Water Quality i) Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?

Answer: Less Than Significant With Mitigation Incorporated

Impact Discussion: Depending on its size, location and design (including, potentially, a levee or dam), a large-scale detention basin or engineered wetland with substantial amounts of retained water could create or contribute to flooding potential for adjacent properties under extreme storm conditions, should the design capacity of the facilities be exceeded or a design feature fail.

Mitigation: Proper siting, design and operation of structural BMPs should avoid or reduce these potential impacts to insignificant levels.

VIII. Hydrology and Water Quality j) Inundation by seiche, tsunami, or mudflow?

Answer: Less than Significant Impact with Mitigation Incorporation

Impact Discussion: Depending on its size, depth, location and design (including, potentially, a levee or dam), a large-scale detention basin or engineered wetland with substantial amounts of retained water could create or contribute to inundation of adjacent properties if a seiche were to occur in the facilities during a large earthquake event, and the facilities design features fail (e.g., facility's freeboard design is exceeded by the seiche).

Mitigation: Proper siting, design and operation of structural BMPs that include adequate consideration of potential seismic effects should avoid or reduce these potential impacts to insignificant levels.

IX. LAND USE AND PLANNING

Will the project ...

IX. Land Use and Planning a) Physically divide an established community?

Answer: No Impact

Impact Discussion: It is unforeseeable that implementation of BMPs at a scale large enough to divide an established community could or would take place in the Newport watershed, given the lack of available land, the high cost of remaining

developable land, and likely community opposition on social, economic, and environmental grounds (e.g., construction and operation of such facilities would likely have substantial effects on air quality, traffic, and public safety (resulting from the potential of failure of the BMPs (e.g., levees) and the physical presence of large-scale facilities that might impede emergency response and traffic flow). Further, property values may be adversely affected.

Mitigation: None necessary.

IX. Land Use and Planning b) Conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project (including, but not limited to the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?

Answer: Less Than Significant Impact

Impact Discussion: Since the locations of potential BMPs that will be implemented to comply with the TMDLs are currently unknown and cannot be dictated by the Regional Board, the potential for this impact is too speculative to consider in detail in this document.

Mitigation: Local and regional planning agencies and resource agencies must be consulted when implementation of BMPs is considered. Potential conflicts with land use plans, policies and regulations must be identified in this process and resolved through selection of alternative BMP sites, designs or facilities. Where any such conflicts cannot be resolved in this manner, then BMP implementation would require prior changes to the applicable plans, policies or regulations.

IX. Land Use and Planning c) Conflict with any applicable habitat conservation plan or natural community conservation plan?

Answer: Less Than Significant Impact

Impact Discussion: See IV. Biological Resources a) above.

Mitigation: See IV. Biological Resources a) above. Consultation with resources agencies, including the California Department of Fish and Game the U.S. Fish and Wildlife Service must occur prior to large-scale BMP implementation to identify and resolve potential conflicts by selection of alternative BMPs, locations or designs.

X. MINERAL RESOURCES

Will the project ...

X. Mineral Resources a) Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state?
X. Mineral Resources b) Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?

Answer (a and b): Less than Significant with Mitigation Incorporation

Impact Discussion: The implementation of non-structural BMPs would not result in physical changes that would result in the change of the availability of a known mineral resource or resource recovery site that is valuable or locally important.

Similarly, no situation is reasonably foreseeable in which the implementation of a structural BMP, if selected by a responsible agency in response to the TMDLs, would affect these resources. However, if in the course of site-specific project design, should such impacts were to be identified, appropriate measures such as site re-design or relocation may be necessary.

Mitigation: Impacts to mineral resources can be avoided or reduced by proper planning, site design and consideration of alternative locations. These mitigation measures can and should be required by local lead and responsible agencies through their CEQA and/or planning processes.

XI. NOISE

Will the project ...

XI. Noise a) Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?

Answer: Potentially Significant

Impact Discussion: Non-structural BMPs that entail the operation of vehicles and equipment (street sweeping and pesticide collection programs) result in increased ambient noise levels of a temporary nature when the equipment/vehicles are present and in use. These BMPs are already implemented in the watershed and the effects of any changes in existing implementation of these non-structural BMPs, if implemented by the responsible parties in response to the proposed TMDLs, are expected to be insignificant.

The construction of BMPs such as detention basins and engineered treatment systems would necessitate increases in the transport and use of vehicles and equipment, which would raise ambient noise levels. While these impacts would be short-term in nature, they nevertheless may be significant during construction. Similarly, dredging operations and the attendant transport of personnel and equipment would increase ambient noise levels. Again, these impacts would occur during the dredging operation and cease once the project is completed. Large-scale dredging projects may require weeks or months to complete. While the noise impacts are not permanent, they may be significant during the period of operation.

Since the specific locations of potential BMPs that will be implemented to comply with the TMDLs are currently unknown and cannot be dictated by the Regional Board, the potential for increased noise levels cannot be assessed at this time in relation to specific general plans or noise ordinances. Construction zones located near residential areas are particularly likely to result in noise impacts since standards for residential areas are generally more stringent than commercial and/or industrial areas and noise levels may be considered severe.

Mitigation: The preparation and implementation of site-specific operational plans that identify a range of measures is recommended to limit the impacts of noise from specific construction and/or maintenance activities to adjacent homes and businesses. Noise impacts can be reduced but not completely avoided by project timing to minimize public exposure, the use of sound barriers such as walls or vegetation, where feasible, and proper operation and maintenance of vehicles and equipment fitted with mufflers.

XI. Noise b) Exposure of persons to or generation of excessive ground borne vibration or ground borne noise levels?

Answer: Potentially Significant

Impact Discussion: See XI. Noise a) above. The transport and use of heavy equipment needed to implement large-scale structural BMPs, or to move disposal containers at hazardous waste collection sites, may result in localized and temporary ground borne vibration or noise. While these impacts would be limited spatially and temporally, they may nevertheless be significant during the operation of the equipment.

Mitigation: See XI. Noise a) above. Equipment should be properly operated and maintained to reduce noise. Movement and use of the equipment could be timed to minimize public exposure to unavoidable noise/ground borne vibration.

XI. Noise c) A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?

Answer: No Impact

Impact Discussion: Dredging and detention basin construction activities will likely result in the increase of noise levels. However, as indicated in the XI. Noise a) impacts discussion above, such impacts would be short-term and limited in duration.

Mitigation: None necessary.

XI. Noise d) A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?

Answer: Potentially Significant

Impact Discussion: See XI. Noise a) above.

Mitigation: See XI. Noise a) above.

XI. Noise e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?

Answer: Potentially Significant

Impact Discussion: See XI. Noise a) above.

Mitigation: See XI. Noise a) above.

XI. Noise f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?

Answer: Potentially Significant

Impact Discussion: See XI. Noise a) above.

Mitigation: See XI. Noise a) above.

XII. POPULATION AND HOUSING

Will the project ...

- XII. Population and Housing a) Induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?
- XII. Population and Housing b) Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?
- XII. Population and Housing c) Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere?

Answer: No Impact

Impact Discussion: It is not foreseeable that the implementation of the TMDLs would induce growth or displace existing housing or require the construction of new homes or businesses. Displacement of existing housing due to large-scale BMP implementation, possibly requiring replacement construction elsewhere, is extremely unlikely, given social, economic and environmental concerns (see IX. Land Use and Planning a), above. New or iterative improvement of existing non-structural BMPs should not result in physical changes that would lead to these effects.

It is unlikely that local planning agencies would allow compliance with the TMDLs to conflict with housing or population needs, which may be viewed as more significant on social and economic grounds. Given the limited availability of developable land and its cost, it is likely that site selection for BMPs would focus on areas not well-suited to housing development and/or that the BMPs would be integrated with new developments to provide open space, parks, and buffers. Such facilities could be used to satisfy existing permit requirements (e.g., MS4 permit). Multiple small-scale BMPs may be selected in lieu of large-scale facilities.

Mitigation: None necessary.

XIII. PUBLIC SERVICES

a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:

Fire protection?

Police protection?

Schools?

Parks?

Other public facilities?

Answer: No impact.

Impact Discussion: The implementation of non-structural and structural BMPs necessary to implement the proposed TMDLs would not result in physical changes to the environment that would necessitate the construction of substantial new or altered governmental facilities, including facilities that would result in substantial adverse environmental impacts.

Mitigation: None necessary.

XIV. RECREATION

Would the project...

XIV. Recreation a) Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?

Answer: Less than significant impact.

Impact Discussion: To achieve compliance with the proposed TMDLs, responsible parties may choose to construct and operate structural BMPs in or adjacent to neighborhood or regional parks. In fact, BMPs may be purposefully designed to serve dual recreational and water quality control purposes. Construction, operation and periodic maintenance of the facilities may cause short-term disturbances that in turn result in increased recreational use of park facilities elsewhere. However, such an effect would be limited in duration and thus not likely to result in substantial deterioration of the alternative facilities.

Disturbance caused by dredging would likely result in the use of alternative locations for recreational purposes, for the duration of the dredging activity. Again, the effect would be limited in duration and thus not likely to result in substantial deterioration of alternative facilities.

Mitigation: None necessary.

XIV. Recreation b) Does the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?

Answer: No impact.

Impact Discussion: No reasonably foreseeable implementation of control measures in response to the proposed TMDLs would include or necessitate the construction/expansion of recreational facilities.

Mitigation: None necessary.

XV. TRANSPORTATION/TRAFFIC

Would the project...

XV. Transportation/Traffic a) Cause an increase in traffic that is substantial in relation to the existing traffic load and capacity of the street system (i.e., result in a substantial increase in either the number of vehicle trips, the volume to capacity ratio on roads, or congestion at intersections)?

Answer: Potentially Significant Impact

Impact Discussion: Construction, operation and maintenance of large-scale structural BMPs and dredging activities would result in increased vehicular traffic, including the transport of personnel and equipment to and from the construction/dredging site and the removal and disposal of sediment/dredge spoils. This impact would be temporary during construction and of limited duration and frequency during operation/maintenance. However, this impact is potentially significant in light of existing road congestion.

Mitigation: This impact may be mitigated to some degree by changing the timing of vehicle movement to evening or early morning hours, when rush hour traffic has subsided. However, in light of potential additional costs associated with night-time construction and practical considerations (e.g., safety, low light levels and the need for artificial lighting), it is not likely that these activities could be sufficiently re-timed to eliminate the traffic impact.

XV. Transportation/Traffic b) Exceed, either individually or cumulatively, a level of service standard established by the county congestion management agency for designated roads or highways?

Answer: Potentially Significant Impact

Impact Discussion: See XV. Transportation/Traffic a), above.

Mitigation: See XV. Transportation/Traffic a), above.

XV. Transportation/Traffic c) Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that result in substantial safety risks?

Answer: No impact.

Impact Discussion: The implementation of structural BMPs in the watershed would not involve use of aircraft and thus would have no effect on air traffic patterns.

Mitigation: None necessary.

XV. Transportation/Traffic d) Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?

Answer: Less than significant with mitigation

Impact Discussion: Improperly designed or constructed large-scale structural BMPs could result in traffic safety hazards, such as intersections with limited sight distance, or sharp curves in adjacent roadways. Construction of the BMPs may require the transport and use of oversize vehicles/equipment. In light of extensive development in the watershed that requires the use/transport of such equipment, any incremental increase in such traffic occasioned by the proposed TMDLs is not likely to be substantial. Further, the use/transport of such of equipment would be limited in frequency and duration.

Mitigation: With proper design and construction, the implementation of structural BMPs should not result in substantial increased roadway hazards. Potential hazards associated with the movement of oversize trucks and equipment can be minimized by proper timing to avoid high traffic periods.

XV. Transportation/Traffic e) Result in inadequate emergency access?

Answer: No impact.

Impact Discussion: There is no reason to suppose that the implementation of reasonably foreseeable structural or non-structural BMPs would have any effect on emergency access.

Mitigation: None necessary.

XV. Transportation/Traffic f) Result in inadequate parking capacity?

Answer: Less than significant.

Impact Discussion: Depending on their size and location, the implementation of large-scale structural BMPs could reduce or eliminate available parking in the vicinity.

Mitigation: This impact could be avoided or mitigated with proper project siting and design, including provision of additional alternative parking.

XV. Transportation/Traffic g) Conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?

Answer: No impact.

Impact Discussion: There is no reason to suppose that the implementation of reasonably foreseeable structural or non-structural BMPs would have any effect on alternative transportation policies, plans or programs.

Mitigation: None necessary.

XVI. UTILITIES AND SERVICE SYSTEMS

Would the project...

XVI. Utilities and Service Systems a) Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?

Answer: Less than significant.

Impact Discussion: As previously discussed (VIII. Hydrology and Water Quality a)), consistent compliance with waste discharge requirements for large-scale dredging projects may be difficult to achieve. However, with proper implementation of equipment and operations, any violations should be infrequent and limited spatially and temporally and therefore not result in significant adverse impacts.

Structural and non-structural BMPs are already being implemented in the watershed, in part to comply with existing waste discharge requirements. Incremental additions to or enhancement of these BMPs may be necessary to comply with new or revised waste discharge requirements based on the TMDLs, if and when the TMDLs are approved.

Mitigation: Violations of waste discharge requirements can be avoided through proper siting, design, construction and operation of BMPs.

XVI. Utilities and Service Systems b) Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Answer: No impact.

Impact Discussion: Implementation of the reasonably foreseeable BMPs necessary to comply with the proposed TMDLs will not result in demands for new sources of potable supply or for additional wastewater treatment and therefore, will not require construction or expansion of water or wastewater treatment facilities.

Mitigation: None necessary.

XVI. Utilities and Service Systems c) Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?

Answer: Potentially significant impact.

Impact Discussion: Implementation of detention basins and/or engineered wetlands will or may become a part of the storm drainage facilities, purposefully designed to reduce pollutants (including sediment) in storm water and nuisance flows. As discussed above, the construction and operation of such facilities may have significant impacts on the environment, including air quality, transportation and traffic and noise levels. Although these impacts are expected to be short term in nature and limited spatially, they may be significant.

Mitigation: Mitigation measures identified in the previous discussions of air quality, transportation/traffic and noise effects may reduce impacts associated with BMP implementation, but it is unlikely that these impacts could be completely avoided.

XVI. Utilities and Service Systems d) Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?

Answer: No impact.

Impact Discussion: The reasonably foreseeable methods of compliance with the proposed TMDLs will not create a demand for new sources of water supply.

Mitigation: None necessary.

XVI. Utilities and Service Systems e) Result in a determination by the wastewater treatment provider that serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?

Answer: No impact.

Impact Discussion: The reasonably foreseeable methods of compliance with the proposed TMDLs will not create a demand for new wastewater treatment.

Mitigation: None necessary.

XVI. Utilities and Service Systems f) Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?

Answer: Potentially significant impact.

Impact Discussion: The locations, magnitude and specific nature of potential BMPs that will be implemented to comply with the TMDLs are currently unknown. It is possible that dredging activities and/or excavation needed to construct large-scale detention basins or engineered wetlands would generate large volumes of spoils that might require landfill disposal (if the soils contain contaminants or other constituents not acceptable for use as fill on-site or at nearby locations) and could exceed available landfill capacity. The lack of available disposal capacity may necessitate changes in BMP selection and implementation.

Mitigation: Pre-project planning should be used to anticipate land disposal needs and to assess the need for implementation of project alternatives. Where insufficient disposal capacity is available, alternative BMPs may need to be selected and implemented. Given the presently speculative nature of the type, magnitude and locations of specific BMPs, It is not known whether landfill capacity issues might preclude use of BMPs necessary to achieve compliance with the proposed TMDLs, though this is considered unlikely.

XVI. Utilities and Service Systems g) Comply with federal, state, and local statutes and regulations related to solid waste?

Answer: No impact.

Impact Discussion: There is no reason to suppose that the implementation of the reasonably foreseeable methods of compliance with the proposed TMDLs would necessitate or result in non-compliance with applicable solid waste regulations.

Mitigation: None necessary.

XVI. MANDATORY FINDINGS OF SIGNIFICANCE

a) Does the project have the potential to degrade the quality of the environment, substantially reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?

Answer: Potentially significant impact.

Impact Discussion: As described in the preceding analysis, the implementation of reasonably foreseeable methods of compliance with the proposed TMDLs could result in potentially significant environmental impacts with respect to certain Air Quality, Biological Resources, Noise, Transportation/Traffic and Utilities and Services considerations. While the majority of these impacts would be expected to most pronounced during periods of construction/dredging and would be limited spatially and/or temporally, these effects may nevertheless be significant for periods of time in areas affected by BMP implementation. Dredging or other construction activities may result in direct mortality or other disturbance leading to mortality, permanent relocation and reduced reproductive success of listed or candidate species.

Mitigation: Mitigation measures may be employed, as described in the preceding analysis, to reduce or in some cases avoid these impacts. However, impacts may be unavoidable in certain locations and/or at certain times, even with the implementation of mitigation measures.

XVI. MANDATORY FINDINGS OF SIGNIFICANCE

b) Does the project have impacts that are individually limited, but cumulatively considerable? ('Cumulatively considerable' means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects)?

Answer: Less than significant impact with mitigation incorporated.

Impact Discussion: As discussed above, the implementation of reasonably foreseeable methods of compliance with the proposed TMDLs may result in spatially and/or temporally limited but potentially significant environmental degradation. These effects are largely related to the construction and operation of large-scale BMPs (detention basins/engineered wetlands and/or dredging) and result from increased vehicular/equipment operation and disposal of any excavated/dredged material. Dredging operations have been and/or are presently being conducted both in the watershed and the Bay to address established TMDLs and to restore and protect biological and navigational beneficial uses. The incremental effects of any additional dredging necessary to comply with the proposed TMDLs are not cumulatively considerable, provided that suitable mitigation measures are employed during the dredging operations (see IV. Biological Resources a), above). Similarly, detention basins/wetlands are being constructed in the watershed and/or are planned in response to established permit/TMDL requirements, or on a voluntary basis. Mitigation measures can be used to avoid or reduce the impacts of these facilities (see IV. Biological Resources a), above). As described in Section 3.1, significant urban development of the watershed is underway, with many of the same attendant environmental consequences of the implementation of the reasonably foreseeable methods of TMDL compliance; increased vehicular and equipment movement, with impacts on traffic/transportation, air quality and noise; the need for disposal of excavated materials, with potential effects on landfill capacity. Therefore, the reasonably foreseeable BMPs that will be implemented to address the proposed TMDLs should not result in cumulatively considerable environmental effects.

Mitigation: Mitigation measures, as described above, designed to address the environmental effects evaluated in the preceding analysis.)

XVII. MANDATORY FINDINGS OF SIGNIFICANCE

c) Does the project have environmental effects that will cause substantial adverse effects on human beings, either directly or indirectly?

Answer: Less than significant

Impact Discussion: As discussed above, the implementation of reasonably foreseeable methods of compliance with the proposed TMDLs may result in spatially and/or temporally limited but potentially significant environmental degradation that could affect human beings (e.g., effects on air quality, noise, transportation/traffic). Again, these impacts are expected to be spatially and/or

temporally limited and are not expected to exert substantial adverse effects on human beings.

Mitigation: None necessary (apart from mitigation measures, described above, designed to address the environmental effects evaluated in the preceding analysis.)

OTHER CONSIDERATIONS

Implementation of the reasonably foreseeable methods of compliance will require financial commitments by responsible parties, including cities, Orange County, local landowners and state agencies (Caltrans). To the extent that financial and staff resources available to these parties are dedicated to achieving compliance with the proposed organochlorine TMDLs, the resources available to conduct other programs, including those required by waste discharge requirements and/or established TMDLs, are likely to be limited. Such financial restrictions may have a variety of social and environmental effects, including the ability of responsible parties to comply with waste discharge requirements/TMDLs, or potentially, to implement other programs needed to protect public health and the environment. The nature of these impacts is recognized but is too speculative to analyze in detail.

Recognizing this potential consequence, the proposed TMDLs employ a phased approach, with an extended compliance schedule. The intent is to allow uncertainties associated with the TMDLs to be addressed so as to assure that limited funds are directed in a fair, effective and responsible manner to address pressing water quality problems in a prioritized fashion. The proposed TMDL implementation plan allows responsible parties in the watershed to develop an implement an integrated program to address multiple TMDL and permit requirements that are already in place or are anticipated. Such an integrated approach allows for prioritization of the expenditure of public resources, avoidance of duplicative or overlapping regulation and response, and can ultimately provide for the most effective, as well as efficient, way to identify and resolve water quality standards issues in the watershed.

6.1 Reasonably Foreseeable Alternative Means of Compliance to Avoid Impacts

CEQA requires an analysis of reasonably foreseeable alternative means of compliance with the rule or regulation, which would avoid or eliminate the identified impacts.²⁰ The reasonably foreseeable methods of compliance with the proposed TMDLs are identified in Section 4. As previously stated, many of these BMPs are already being implemented in Newport Bay and its watershed in

²⁰ 14 CCR section 15187 (c) (3) Wanda – note that I changed the font here

response to existing permit requirements, established TMDLs for the watershed, and/or on a voluntary basis.

A wide variety of permutations and combinations of these BMPs could be selected for implementation, taking into account physical, environmental and fiscal constraints, opportunities to integrate BMP implementation to meet these and other TMDLs and permit requirements, and opportunities to coordinate BMP implementation with habitat and wildlife restoration and protection goals. Because there are innumerable ways to combine the BMPs, all of the possible alternative means of compliance cannot be discussed here. However, because most of the significant adverse environmental effects would result from the implementation of large-scale BMPs, such as detention basins and dredging activities, alternatives that minimize the use, scope and environmental impacts of these facilities/activities should be identified and implemented, provided that compliance with the TMDLs can be achieved. The use of non-structural BMPs, with more limited adverse environmental effects, should be maximized.

Section 13360 of the Water Code specifies that the Regional Board cannot dictate the compliance measures responsible agencies may choose to adopt, or which mitigation measures they would employ, in response to the implementation of the OCs TMDLs. However, the Regional Board recommends that appropriate compliance and mitigation measures, as discussed herein, which are readily available and generally considered to be consistent with industry standards, be applied in order to reduce, and if possible avoid, potential environmental impacts, such that there is no significant impact. Since the decision to perform these measures is strictly within the responsibility and jurisdiction of the individual implementing agencies, such measures can and should be adopted by these agencies. (Title 14, California Code of Regulations, Section 15091(a)(2).)

As such, dischargers will choose to use the structural and non-structural BMPs described in Section 4 or other structural and non-structural BMPs, to control and prevent pollution, and meet the load reductions required by the TMDLs. The alternative means to comply with the TMDLs consist of the innumerable ways to combine the structural and non-structural BMPs typically used by the responsible agencies. However, because the construction and installation of large scale structural BMPs are associated with adverse environmental effects, compliance alternatives should minimize structural BMPs in general and maximize non-structural BMPs. If structural BMPs are selected, they should be sized and designed to minimize, avoid or eliminate environmental impacts.

7 Reasonable Alternatives to the Proposed Activity

Pursuant to the State Water Board's regulations for implementing the CEQA²¹, this environmental review must include an analysis of reasonable alternatives to the proposed adoption of the Basin Plan amendment to include organochlorine compound TMDLs for San Diego Creek and Newport Bay. The intent is to consider whether there are reasonable alternatives that would fulfill the underlying purpose of the proposed amendment to achieve and protect water quality standards, but minimize or eliminate the potential adverse environmental effects discussed above. The alternatives evaluated include:

- (1) No Project
- (2) Adopt a Basin Plan amendment to incorporate an implementation plan for the organochlorine chlorine compounds TMDLs promulgated by USEPA
- (3) Alternative approaches to TMDL development, including:
 - (i) Alternative guidelines for evaluating impairment that may affect impairment findings and the need for TMDLs for one or more organochlorine compounds
 - (ii) Alternative numeric targets as the basis for calculating TMDLs
- (4) Alternative approaches to TMDL implementation, including compliance schedules.

Each of these alternatives is discussed below.

7.1 No Project Alternative

The "No Project" alternative would mean that the Regional Board would not adopt organochlorine compounds TMDLs with an implementation plan, including a monitoring program.

The existing Environmental Setting (see Section 3, above; see also November 17, 2006 Organochlorine Compounds TMDLs Technical Report, sections 1.1 and 2.0) establishes the baseline for the analysis of the no project alternative. Briefly, beginning in the 1990's, San Diego Creek and Newport Bay were included on State-adopted and USEPA-approved Clean Water Act Section 303(d) lists of impaired waters due, in part, to toxic substances. Clean Water Act Section 303(d) requires that TMDLs be established to address this impairment²². Based on the agency's separate impairment

²¹ CCR title 23, sec. 3777(a)

²² Per Clean Water Act Section 303(d) and implementing federal regulations, TMDLs must be established to address water quality standards impairment, unless states document, to the satisfaction of USEPA, that there are other pollution control requirements (e.g., BMPs) sufficiently stringent to achieve applicable

assessment, USEPA promulgated TMDLs for specific Newport Bay/San Diego Creek waterbody/organochlorine compound combinations in 2002. The State Board adopted and USEPA approved 2006 303(d) list confirms impairment of specific waters in the Newport Bay watershed, and the Bay itself, due to identified organochlorine compounds. The waterbody/organochlorine pollutant combinations identified in the 2006 303(d) list differ from the list of USEPA promulgated TMDLs. Specifically, USEPA-established TMDLs included TMDLs for dieldrin for Lower Newport Bay and San Diego Creek, and for chlordane and PCBs in San Diego Creek. In contrast, impairment assessments conducted by Regional Board staff (see November 17, 2006 TMDLs Technical Report, Section 2.3), and by State Board staff to support the 2006 303(d) listing process, found no impairment due to dieldrin in either San Diego Creek or Lower Newport Bay, and no impairment due to chlordane or PCBs in San Diego Creek. Based on these findings, the TMDLs proposed by Regional Board staff do not include dieldrin for either the Lower Bay or San Diego Creek. Further, Board staff recommends informational TMDLs only for chlordane and PCBs in San Diego Creek. These informational TMDLs would not be required to be implemented (see November 17, 2006 TMDLs Technical Report, Section 2.4.4) and Attachment to Resolution No. R8-2007-0024, 4.b.).

water quality standards within a reasonable period of time. EPA has interpreted that these requirements must already be implemented, not just proposals to undertake specific activities. USEPA guidance describes the demonstrations that states must make to justify the conclusion that other control requirements obviate the need for TMDLs ("Guidance for 2006 Assessment, Listing and Reporting Requirements Pursuant to Sections 303(d), 305(b) and 314 of the Clean Water Act", pages 53-56 (discussion re Category 4b segments)). EPA acknowledges that the level of rigor necessary to support the state's rationale will vary depending on the complexity of the impairment and the implementation strategies in place to address it. Accordingly, USEPA evaluates each such proposal on a case-by-case basis.

In the case of the organochlorine compounds for San Diego Creek/Newport Bay, USEPA Region IX staff have indicated that approval of a control alternative-to-TMDLs approach would require the demonstration that there is a definitive connection between source controls of sediment (sediment transport is the principal method of transport of the organochlorine compounds within the watershed (see November 17, 2006 TMDLs Technical Report, Section 3.4) and corresponding reduction of organochlorine compounds in the watershed and receiving waters (Personal communication from Peter Kozelka, USEPA Region IX, to Regional Board staff, January 9, 2007). The Regional Board would have to demonstrate that sufficient BMPs have been implemented and that monitoring confirms that implementation of these BMPs results in a definite decline in organochlorine compound loadings. USEPA Region IX also assumes that compliance within a "reasonable period of time" would be defined as within the next 303(d) listing cycle or two years, whichever comes first. Given these constraints, it is not feasible to demonstrate that pollution control requirements obviate the need for TMDLs in this case, since the monitoring data to document reductions in organochlorine compound loadings as the result of the sediment control BMP implementation are not available. Further, while BMP implementation in response to existing federal and state established TMDLs and waste discharge requirements (see text), together with natural attenuation of the organochlorine compounds, should result in reductions of loadings of these compounds over time, it is not feasible to identify the schedule by which water quality standards will be achieved. The conclusion that an existing alternative pollution control strategy does not suffice to obviate the need for TMDLs is confirmed by USEPA's action to promulgate TMDLs for the organochlorine compounds for San Diego Creek and Newport Bay in 2002 (see text).

If the Regional Board does not adopt the proposed Basin Plan amendment to incorporate organochlorine compound TMDLs (i.e., the No Project Alternative), then the Board must implement the USEPA promulgated TMDLs²³. The USEPA TMDLs do not include an implementation plan or compliance schedules, since implementation strategies are within the purview of the state. The TMDL Basin Plan amendment proposed by Regional Board staff includes an implementation plan and compliance schedules.

Also as described in "Environmental Setting" (see Section 3, above; see also November 17, 2006 TMDLs Technical Report, Sections 1.1 and 2.0), Newport Bay and San Diego Creek are also included on the Clean Water Act Section 303(d) list of impaired waters as the result of nutrients and sediment. TMDLs have been established to address these impairments. These TMDLs require implementation of measures to reduce nutrient and sediment loading to the Bay and its watershed and to conduct monitoring to evaluate the efficacy of control measures and compliance with the TMDLs, including load and wasteload allocations. These TMDLs are being implemented.

The Regional Board and State Board have adopted requirements (NPDES permits and Waste Discharge Requirements) that regulate certain types of waste discharges in the San Diego Creek/Newport Bay watershed (see November 17, 2006 TMDLs Technical Report, Section 8, Table 8-2 and Section 8.3.4). These waste discharge requirements have been or must be revised to include requirements necessary to implement all established TMDLs in the Newport Bay watershed, including limitations based on applicable wasteload and load allocations and monitoring requirements. In summary, the relevant context in which to consider the environmental effects of the No Project Alternative relative to those of the proposed Basin Plan amendment includes: TMDLs for organochlorine compounds established by USEPA in 2002 that must be implemented by the Regional Board; nutrient and sediment TMDLs that have been established and are now being implemented; and, existing waste discharge requirements that include or must be revised to include requirements necessary to implement established TMDLs, including the organochlorine compounds TMDLs promulgated by USEPA. The established TMDLs and relevant waste discharge requirements (e.g., the General Permit for Discharge of Storm Water Runoff Associated with Construction Activity (Order No. 99-08-DWQ) and the Orange County areawide urban stormwater permit (Order No. R8-2002-0010, NPDES No. CAS618030)), require or will require implementation of sediment control measures and an iterative process, based on the results of monitoring, to improve those control measures where necessary

²³ It may be noted again (see also Section 3, above) that if the Regional Board adopts the proposed organochlorine compound TMDLs, then these TMDLs would supersede those established by USEPA upon USEPA approval. However, any USEPA-established TMDL will remain in effect unless it is included in the proposed TMDLs approved by the state or the appropriate delisting is approved. The proposed TMDLs do not include dieldrin for San Diego Creek or Lower Newport Bay, or chlordane and PCBs for San Diego Creek (see text). Therefore, USEPA-established TMDLs for dieldrin in Lower Newport Bay and San Diego Creek, and for chlordane and PCBs in San Diego Creek would remain in effect upon approval of the proposed organochlorine compound TMDLs and would need to be implemented in waste discharge requirements unless and until appropriate delistings of these pollutant/waterbody combinations are approved.

to achieve needed sediment and associated pollutant (e.g., organochlorine compounds and phosphorus) reductions.

The principal foci of the implementation plan proposed by Regional Board staff to achieve compliance with the recommended organochlorine compounds TMDLs are: (1) implementation/enhancement of control measures to reduce loadings of sediment and, thereby, organochlorine compounds to surface waters in the Newport Bay watershed; and (2) monitoring and other investigations to evaluate the efficacy of the control measures implemented, determine compliance with the TMDLs, and address uncertainties to provide a technical basis for future refinement of the TMDLs. The Environmental Checklist (Section 5) identifies potential environmental impacts that may result from the reasonably foreseeable methods of compliance, i.e., implementation/enhancement of sediment control measures. These sediment control measures (and monitoring/investigation requirements specified in the proposed implementation plan) are, or are expected to be, essentially the same as those specified or to be specified in waste discharge requirements to implement already established TMDLs, including the organochlorine compounds TMDLs promulgated by the USEPA. Therefore, the No Project Alternative would not have any less potential environmental effect than the adoption and implementation of the proposed organochlorine compound TMDLs.

The No Project Alternative might have a greater potential adverse environmental effect than the proposed amendment to incorporate organochlorine compounds TMDLs for the following reason. In the absence of the amendment, the Regional Board must implement the USEPA-established TMDLs. No compliance schedule is specified in the USEPA TMDLs and, accordingly, the Regional Board has no discretion to include compliance schedules in NPDES permits issued to responsible parties to implement the TMDLs. (Where immediate compliance with the permit requirements necessary to implement the TMDLs (e.g., effluent limitations based on wasteload allocations) is infeasible, a compliance schedule could be specified only in an enforcement order (e.g., cease and desist order)). The lack of compliance schedule authorization would likely make it more difficult to justify or provide compliance schedule relief and thus necessitate actions by responsible parties on an immediate basis. In contrast, the proposed amendment includes compliance schedules that would be used as the basis for specifying in permits schedules for compliance with requirements needed to implement the TMDLs. The compliance schedules are part of the proposed implementation plan, which explicitly recognizes that time is necessary both to achieve compliance and to address uncertainties that may affect the TMDLs. The proposed implementation plan includes monitoring, special studies and review of the scientific aspects of the TMDLs by an Independent Advisory Panel (see Attachment to Resolution No. R8-2007-0024, Section 4.b.3., Implementation of Organochlorine Compounds TMDLs). These investigations and review may lead to recommendations for revisions to the TMDLs, including delisting of certain waterbody/pollutant combinations. The proposed implementation plan explicitly calls for review of the TMDLs to consider such refinements. To the extent that any such refinements would decrease the scope of the TMDLs and the control measures required, the potential environmental effects would

also likely be reduced. Furthermore, the proposed implementation plan provides watershed stakeholders an opportunity to participate in an integrated Work Plan approach (see Attachment to Resolution No. R8-2007-0024, Section 4.b.3., Implementation of Organochlorine Compounds TMDLs, Task 7) that is intended to address the multiple water quality impairments in the San Diego Creek/Newport Bay watershed in a comprehensive manner. The Work Plan approach is expected to provide a more effective and efficient method of addressing water quality problems affecting these waters. To the extent that control measures can be implemented to address multiple causes of impairment, the potential environmental effects of separate implementation of control measures would likely be reduced.

7.2 Adopt an Implementation Plan for USEPA TMDLs

In lieu of adopting the proposed organochlorine compounds TMDLs and implementation plan, the Regional Board could adopt a Basin Plan amendment to incorporate the TMDLs promulgated by the USEPA in 2002, with an appropriate implementation plan. As discussed below, this alternative is not legally available and was rejected on that basis. Further, even if this alternative were legal, the potential environmental effect of this alternative would not be appreciably different than that of the proposed TMDLs and implementation plan recommended by Regional Board staff.

Regional Board staff's recommended organochlorine compounds TMDLs differ from those established by USEPA in several ways. First, as described in the No Project Alternative discussion, Board staff does not recommend TMDLs for dieldrin for Lower Newport Bay or San Diego Creek and recommends only informational TMDLs (that do not need to be implemented) for chlordane and PCBs in San Diego Creek. This difference resulted from a revised impairment assessment conducted by Board staff that relied on new data and the evaluation criteria specified in the State Board's Water Quality Control Policy for Developing California's Clean Water Act Section 303(d) List (September 2004) ("Listing Policy"). Second, in calculating loading capacities, Board staff relied on the sediment loading allowed by the established sediment TMDL for the San Diego Creek/Newport Bay watershed. This was done to assure consistency between the sediment and proposed organochlorine compounds TMDLs. In contrast, USEPA calculated loading capacities using the estimated current sediment loading to San Diego Creek and Newport Bay, resulting in higher loading capacities than would be obtained by using the sediment TMDL allowable loads. (See November 17, 2006 Technical TMDLs Report, Sections 2.3 and 5.2). In turn, USEPA's loading capacities result in higher wasteload and load allocations. USEPA's approach was not consistent with the established sediment TMDL. Third, Board staff's TMDLs include technical corrections (short-ton rather than metric ton conversions; a revised partition coefficient for DDT to reflect a weighted average for DDT and its breakdown products (DDE and DDD), rather than an arithmetic average).

Consideration of a Basin Plan amendment to incorporate USEPA's TMDLs, with an implementation plan is not a legally feasible alternative since those TMDLs do not

comport with the regulations established in the sediment TMDL for the San Diego Creek/Newport Bay watershed. No further analysis of this alternative is required given that it is not legally available to the Regional Board.

However, it is worth noting that even if this option were legally available, the implementation plan developed to implement the USEPA TMDLs would be essentially the same as that proposed for Board staff's recommended TMDLs. While USEPA's loading capacities and allocations are higher than those recommended by Board staff, they include TMDLs for more pollutant-waterbody combinations and they are still very low. The implementation measures needed to achieve them would, therefore, not be appreciably different and the potential environmental effect of this alternative would be the same as that of the recommended alternative.

7.3 Alternative Approaches to TMDL Development

7.3.1 Alternative Guidelines for Evaluating Impairment

The impairment assessment conducted by Board staff (see November 17, 2006 Technical TMDLs Report, Section 2.0) relied on evaluation of data in accordance with the Listing Policy. The Listing Policy specifies that narrative water quality objectives, such as the narrative objectives for toxic substances addressed by the proposed organochlorine TMDLs, shall be evaluated using evaluation guidelines that represent standards attainment or beneficial use protection. The Listing Policy identifies the considerations that shall be used in the selection of evaluation guidelines (Listing Policy, Section 6.1.3 "Evaluation Guideline Selection Process"). Guidelines acceptable for use in evaluating sediment quality data and fish and shellfish tissue data (from both human health and aquatic life protection perspectives) are identified. Regional Board staff relied on these guidelines in conducting the organochlorine compounds impairment assessment. Based on this assessment, Board staff developed the proposed TMDLs for those organochlorine compounds shown to be causes of impairment.

The Listing Policy allows use of alternative evaluation guidelines provided that specific criteria are met. These criteria provide, in part, that alternative guidelines must be scientifically-based and peer reviewed (Listing Policy, Section 6.1.3 "Evaluation Guideline Selection Process").

Use of evaluation guidelines other than those employed by Regional Board staff could result in different findings of impairment for one or more of the organochlorine compounds now identified on the 303(d) list and for which TMDLs are proposed by staff. If such an assessment were to indicate no impairment as the result of one or more of these compounds, then the appropriate next step would be to consider delisting. If delisting of one or more of these compounds were to be approved, then TMDLs for those compounds would not be necessary, and the potential environmental effects of reasonably foreseeable methods of compliance (sediment control measures) with TMDLs otherwise required for these substances would be eliminated.

In short, an approved delisting is necessary to obviate the need for some or all of the TMDLs²⁴; use of alternative evaluation guidelines in the impairment assessment alone would not suffice to reduce or eliminate the potential environmental effects of the proposed TMDLs.

Use of alternative evaluation guidelines was recommended by certain stakeholders during the development of the proposed organochlorine compounds TMDLs. These stakeholders questioned Regional Board staff's use of screening values identified by the Office of Environmental Health Hazard Assessment (OEHHA) and the National Academy of Sciences (NAS) guidelines, asserting that both the OEHHA and NAS guidelines are dated and that the NAS values contain errors that preclude their use. These stakeholders suggested an alternative marine DDT fish tissue threshold for purposes of evaluating whether narrative objectives are being met; that is, if bioaccumulation of DDT in fish or other aquatic organisms is causing or contributing to adverse impacts to aquatic life, wildlife or human health. Because the stakeholders' suggested threshold tissue value has not been peer-reviewed and published, this value does not meet the requirements specified in section 6.1.3 of the State Listing Policy for selection of evaluation guidelines to be used in assessing water quality impairment. Therefore, the suggested value was not considered when impairment thresholds were selected.

7.3.2 Alternative Numeric TMDL targets

Numeric targets are the basis for calculation of TMDLs. The selection of numeric targets can significantly affect the TMDLs and the reductions in existing loadings of pollutants necessary to achieve the TMDLs. The reasonably foreseeable methods of compliance, including the number, type, location and size of source control measures needed to achieve the reductions, vary accordingly. In turn, the type and magnitude of potential environmental impacts depends on the variation in compliance methods. As a general rule, less stringent numeric targets will result in less stringent TMDLs and may result in less extensive implementation of control measures to achieve compliance. Therefore, less stringent numeric targets may be associated with reduced potential environmental effects. Whether the differential environmental effect is significant depends on the magnitude of the differences between the selected targets, and the calculated TMDLs.²⁵

²⁴ The presence of the USEPA organochlorine compounds TMDLs (see discussion of the No Project Alternative) must be considered again: even if a revised impairment assessment based on alternative evaluation guidelines leads to an approved delisting for one or more organochlorine compounds, any USEPA TMDL not addressed by the delisting would have to be implemented. The differential environmental effect of the alternative impairment assessment/delisting is too speculative to consider.

²⁵ As noted in the discussion of Alternative 2, above, while there are numerical differences in USEPA's and Regional Board staff's proposed TMDLs, both are low numbers and implementation would be expected to be essentially the same.

Board staff considered a range of alternatives for numeric sediment and fish tissue targets (see November 17, 2006 TMDLs technical Report, Section 3). The proposed numeric targets are, for the most part, those that were used by USEPA in establishing organochlorine compounds TMDLs in 2002. Tissue targets that are protective of aquatic life and wildlife are guidelines recommended by the State Board in the Listing Policy for assessing water quality impairment. Sediment targets are conservative, low-threshold Sediment Quality Guidelines (SQGs) that, if achieved, will ensure that the organochlorine compounds do not cause or contribute to direct toxicity to benthic organisms. The assumption is made that by protecting benthic organisms from direct effects, higher trophic level aquatic species, wildlife and humans will also be protected from bioaccumulation effects. The targets selected by Regional Board staff are conservative and will assure that water quality standards are achieved. This is consistent with the legal requirement that TMDLs achieve standards. In addition, the recommended TMDLs include a margin of safety to ensure protection of beneficial uses. The proposed amendment to incorporate organochlorine compounds TMDLs explicitly recognizes existing uncertainty pertaining to the targets. The proposed implementation plan includes monitoring and special investigations designed to address that uncertainty (see Attachment to Resolution No. R8-2007-0024, Section 4.b.3). It also provides for review of the targets and other scientific aspects of the TMDLs by an Independent Advisory Panel. The TMDLs will be reviewed and the numeric targets and other aspects of the TMDLs may be revised based on this additional investigation and evaluation (Attachment to Resolution No. R8-2007-0024, Section 4.b.3). To accommodate this additional investigation, review and possible refinement, the proposed TMDL implementation plan specifies a compliance schedule.

Alternative targets were recommended by certain stakeholders during the development and consideration of the proposed TMDLs. Use of the recommended alternative targets would have led to less stringent TMDLs and, in some cases, to TMDLs at or exceeding existing loadings of organochlorine compounds, indicating that TMDLs are in fact not necessary for these compounds. Significantly less stringent TMDLs, or elimination of TMDLs (if justified through a delisting process (see discussion of alternative guidelines for evaluating impairment above)), would be expected to result in reduced environmental effects. However, Board staff rejected the recommended alternative targets on one or both of two grounds: first, the recommended alternative numeric targets were based on observable effects levels, which, in Board staff's judgment, are not sufficient to assure protection of beneficial uses and thus to achieve water quality standards; second, the recommended alternative targets have not been subjected to scientific peer-review. Consistent with the requirements of the Listing Policy, selected numeric targets should be peer-reviewed and published. In short, the recommended alternative targets are not consistent with either statutory or regulatory requirements that TMDLs achieve standards or with relevant State Board Policy requirements.

The USEPA has indicated support for the proposed numeric targets (January 11, 2007 letter from Alexis Strauss, USEPA to Carole Beswick, Chairperson of the Regional Board), which have been widely used in California to address impacts from bioaccumulative toxic pollutants. USEPA supports adoption of the proposed

amendment to incorporate the organochlorine compounds TMDLs. It is highly unlikely that USEPA would approve TMDLs that rely on the alternative targets recommended by the stakeholders, for the reasons discussed in the preceding paragraph. As discussed previously (see discussion of No Project Alternative, and footnote 3), absent Regional Board-adopted and USEPA-approved TMDLs, the Regional Board would be required to implement the TMDLs promulgated by USEPA. Thus, the relative environmental effect of proposed TMDLs based on the alternative numeric targets would be essentially the same as the No Project Alternative (see discussion above).

7.4 Alternative approaches to TMDL implementation, including compliance schedules

Regional Board staff recommends a phased approach to implementation of the proposed TMDLs, including a schedule for compliance with the TMDLs and wasteload and load allocations and a commitment to review the TMDLs and revise them as necessary. The proposed implementation plan identifies specific tasks that must be pursued by the Regional Board and responsible parties to achieve compliance, with interim schedules. The proposed plan also provides for an integrated Work Plan approach to implementation of these tasks and those necessary to implement other TMDLs so as to address water quality problems in the watershed in a comprehensive and potentially more effective and efficient manner (see Attachment to Resolution No. R8-2007-0024, Section 4.b.3; also see discussion of No Project Alternative, above).

A variety of permutations and combinations of tasks and schedules necessary to implement the TMDLs could be considered. Board staff's plan is intended to assure that actions necessary to achieve the TMDLs, and thereby water quality standards, are achieved within a reasonable period of time, as required by the Clean Water Act and implementing federal regulations. Certain stakeholders recommended that adoption of the TMDLs be withheld pending resolution of technical uncertainties, especially with respect to the numeric targets selected. The environmental effect of this alternative would be the same as that of the No Project Alternative, since in the absence of Regional Board adoption of TMDLs, and their approval by the state and USEPA, the Board must implement the TMDLs promulgated by the USEPA.

A longer time schedule than that proposed for compliance with the TMDLs might reduce the potential environmental effect of implementation of the TMDLs, if, during the extended time period, substantive revisions to the TMDLs and/or implementation plan were made such that the reasonably feasible methods of compliance (control measures) were reduced or eliminated. This situation is too speculative to consider in detail. This alternative was considered but rejected on the basis that (1) the schedule proposed by Board staff appears to provide a reasonable period to implement the tasks necessary to achieve compliance or to consider revisions where necessary before final compliance must be achieved; (2) the TMDLs will be implemented in a phased, adaptive manner with a specific commitment to review and revise as necessary, including modification of the compliance schedules if demonstrated to be appropriate and

necessary; and, (3) finally, and most importantly from the perspective of this environmental review, a longer schedule would not likely be approved by USEPA or other stakeholders. The expected result would be that the Regional Board would be required to implement USEPA's TMDLs, which do not specify a compliance schedule. Immediate compliance with these TMDLs would be required. The relative environmental effect of implementation of USEPA's TMDLs is discussed in the No Project Alternative section above.

A shorter time schedule or even a requirement for immediate compliance was also considered but rejected by Board staff, recognizing that compliance actions would require some time to implement, and that a reasonable period of time is necessary to address inherent uncertainties in the TMDLs. The potential environmental effects of a shorter or immediate compliance schedule would likely be more severe, given that there would not be an allowance of time to consider appropriate control actions and to integrate them with control actions necessary to achieve other TMDLs and waste discharge requirements. As discussed previously (see No Project Alternative discussion above), the proposed implementation plan provides an opportunity for integration of control measures to address multiple sources of impairment. This should reduce the overall environmental impact of multiple control measures implemented individually, and should provide more effective, timely and resource-efficient control of water quality standards impairment in the watershed.

In sum, the net effect of the proposed implementation plan and schedules is to provide a reasonable time frame for responsible parties to implement the tasks identified by Board staff, to identify the need for modification of the TMDLs and/or implementation plan, and to address water quality standards problems affecting Newport Bay and its watershed in a coordinated, comprehensive manner. The flexibility provided by the proposed implementation plan allows the responsible parties to identify and implement actions that minimize environmental impacts and/or provide requisite mitigation on a case-specific basis. The increased emphasis on the integrated Work Plan approach reflected in the revised proposed implementation plan responded to recommendations and requests from the stakeholders to provide this more flexible, integrated opportunity to address water quality standards challenges in the Newport watershed.

CEQA DETERMINATION

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" as indicated by the checklist on the following pages.

<input type="checkbox"/> Aesthetics	<input type="checkbox"/> Agricultural Resources	<input checked="" type="checkbox"/> Air Quality
<input type="checkbox"/> Biological Resources	<input type="checkbox"/> Cultural Resources	<input type="checkbox"/> Geology/Soils
<input type="checkbox"/> Hazards & Hazardous Materials	<input type="checkbox"/> Hydrology / Water Quality	<input type="checkbox"/> Land Use / Planning
<input type="checkbox"/> Mineral Resources	<input checked="" type="checkbox"/> Noise	<input type="checkbox"/> Population / Housing
<input type="checkbox"/> Public Services	<input type="checkbox"/> Recreation	<input checked="" type="checkbox"/> Transportation / Traffic
<input checked="" type="checkbox"/> Utilities / Service Systems		<input checked="" type="checkbox"/> Mandatory Findings of Significance

II. DETERMINATION

On the basis of this initial evaluation:

- ___ I find that the proposed project COULD NOT have a significant effect on the environment.
- ___ I find that the proposed project MAY have a significant effect on the environment. However, there are feasible alternatives and/or mitigation measures available that will substantially lessen any adverse impact. These alternatives are discussed in the attached written report.
- __X__ I find that the proposed project MAY have a significant effect on the environment. There are no feasible alternatives and/or feasible mitigation measures available that would substantially lessen any significant adverse impact. See Sections 5 and 6 for a discussion of this determination.

Signature: _____ Date: _____

Wanda Cross, Director
Office of Coastal Waters Planning

The documents below can be downloaded from our web site after
August 25, 2007:
www.waterboards.ca.gov/santaana

ATTACHMENT C TO SEPTEMBER 7, 2007 SUPPLEMENTAL STAFF REPORT

RESPONSE TO COMMENTS DOCUMENT

ATTACHMENT C1 Response to Flow Science, Inc. Reports

Part A - DDT

Part B - Chlordane

Part C - Toxaphene

ATTACHMENT C2 Response to Dec 1, 2006 Public Workshop Comments

ATTACHMENT C3 Response to Peer Review Comments

ATTACHMENT C4 Response to State and Federal Agency Comments

ATTACHMENT C5 Response to Local Agencies/Municipalities Comments

ATTACHMENT C6 Responses to Local Stakeholder Groups Comments

ATTACHMENT C7 List of References Cited

*(Please contact Terri Reeder (951-782-4995; treeder@waterboards.ca.gov) or
Wanda Cross (951-782-4468; wcross@waterboards.ca.gov) if you have any question regarding this
document.)*

The documents below can be downloaded from our web site:
www.waterboards.ca.gov/santaana

ATTACHMENT D TO SEPTEMBER 7, 2007 SUPPLEMENTAL STAFF REPORT

FLOW SCIENCE REPORTS

ATTACHMENT D1 DDT

ATTACHMENT D2 Chlordane

ATTACHMENT D3 Toxaphene

(Please contact Terri Reeder (951-782-4995; treeder@waterboards.ca.gov) or Wanda Cross (951-782-4468; wcross@waterboards.ca.gov) if you have any question regarding this document.)

The documents below can be downloaded from our web site:
www.waterboards.ca.gov/santaana

ATTACHMENT E TO SEPTEMBER 7, 2007 SUPPLEMENTAL STAFF REPORT

**RESPONSES SOLICITED FROM OUTSIDE EXPERTS RE DRS. BYARD AND
TJEERDEMA COMMENTARIES**

CH2MH OHLENDORF EMAIL 02-02-07
USFWS KUBIAK EMAIL 02-15-07
USFWS ZEEMAN EMAIL 02-07-07
NOAA MACDONALD LETTER 03-06-07
MESL COMMENTS ON OCS TMDLS 02-19-07

*(Please contact Terri Reeder (951-782-4995; treeder@waterboards.ca.gov) or
Wanda Cross (951-782-4468; wcross@waterboards.ca.gov) if you have any question regarding this
document.)*

From: <Harry.Ohlendorf@CH2M.com>
To: <treeder@waterboards.ca.gov>
Date: 2/2/2007 10:53:23 AM
Subject: RE: Critique on DOI NIWQP DDT chapter by Jim Byard on behalf of The Irvine Co.

Terri -

It's true that one of our staff did the literature review/summary for DDT in that document some 8 or 10 years ago. Regrettably, there are some errors, but they don't really affect the conclusions concerning effect levels for DDE-associated changes in eggshell quality (thickness or thickness index) for cormorants (or terns). Hence, rather than countering/discussing the criticisms, I offer the following summary/interpretation for your use, based on the references cited in Appendix D (I did not pull out all the old papers [only some], so much of this is based on material in the appendix.):

- * It is acknowledged that cormorants and terns are not among the most sensitive species to the effects of DDE, but their eggshell quality and reproductive success has been affected, as summarized in the appendix and below.
- * There is a great deal of variation in the relationship between DDE and eggshell thickness or thickness index among the various studies. However, at elevated DDE concentrations there is a generalized pattern of effects, with some studies of cormorants finding that 80% of the variation in eggshell thickness was associated with DDE. The threshold for reproductive impairment is considered to be in the range from 10-20% reduction in eggshell thickness, though it can not be defined precisely with much certainty for all species.
- * For cormorants, Anderson et al. (1969) found 4.5% thinning associated with 10.4 ppm DDE, and severe effects in a colony that had a 25% decrease in eggshell thickness.
- * Faber and Hickey (1973) (from which Byard included Figure 1) found an association between DDE and eggshell thickness for a number of species, with double-crested cormorant among those showing effects. Figure 1 shows the relationship between total organochlorine residues and percent decrease in thickness index. For the cormorant, the decrease is 15%, which is associated with a total concentration of 348 ppm (combining values for DDE, PCBs, etc. from Table 2 of the Faber and Hickey paper). Converting the lipid-weight value for DDE (188.4 ppm) to wet-weight basis (to be consistent with other cited references and more recent convention) gives an estimated mean concentration of 8.23 ppm that is associated with the 15% decrease in eggshell thickness index. (Note that this value would be consistent with the findings in the Pearce et al. [1979] study mentioned later, which was the only cormorant study included in the NIWQP summary.)
- * Gress et al. (1973) found 29 and 38% eggshell thinning associated with DDE

residues of 32 and 24 % on Anacapa and Los Coronados Islands.

* Pearce et al. (1979) reported that 10 ppm DDE was associated with eggshell thinning of 20% (though they did not report the eggshell data in the paper). Their summary/comparison of results (Table 7 of their paper), shows that Koeman et al. (The impact of persistent pollutants in piscivorous and molluscivorous birds. TNO-nieuwas 27:561-569; 1972) similarly found 20% eggshell thinning for great cormorants associated with 10 ppm DDE in eggs.

* Weseloh et al (1983) found eggshell thickness reduction of 23.9% associated with 14.5 ppm DDE.

* Dirksen et al. (1995) found that 4 ppm DDE caused 5% shellthinning.

* Custer et al. (1999) reported that DDE concentrations were correlated with decreased eggshell thickness, but that DDE contamination (mean DDE concentration of 3.9 ppm) did not seem to be a significant risk factor for cormorants.

* For terns, several studies have suggested that contamination/exposure on the wintering grounds (including southern California to Peru for common terns nesting in Alberta) may have been a more significant factor than exposure in the breeding areas.

* Switzer et al. (1973) found a correlation between DDE residues (mean of 4.52 ppm) and shell thinning for common terns in Alberta, but did not attribute reproductive failure to DDE.

* Fox (1976) reported average eggshell thinning of 3.8% in all eggs and 13.5% in dented eggs from a colony of common terns in Alberta; average DDE concentrations in eggs were 3.98 ppm, with most exposure occurring in the wintering grounds; DDE and other organochlorines were causing various effects on eggs and embryos at exposures below those known to cause eggshell thinning and reduced hatching success.

* Pearce et al. (1979) concluded that DDE egg residues of 0.49-1.11 ppm did not affect common tern reproduction.

* The Ohlendorf et al. (1985) study results (conducted at a colony in southern San Diego Bay) are accurately summarized by Byard. Reproductive impairment (broken eggs or eggs containing chicks that died during hatching) was found in Caspian terns for which the mean DDE concentrations were 9.3 ppm in randomly collected eggs and 10.0 ppm in hatching-failure eggs (ranges, however, were very wide: 2.7-34 ppm and 2.1-56 ppm, respectively). Shells of eggs that were broken in the nest, or in which the chick died in hatching, etc., were significantly thinner than those of randomly collected eggs (11.1% thinner) or historic (pre-DDT; 14.2% thinner) eggshells. DDE concentrations were significantly correlated to eggshell thickness index (i.e., eggshell quality), but not to directly-measured thickness of the eggshells. Elegant terns, which had comparatively good reproductive success, had an average of 3.79 ppm in randomly

collected eggs (range 2.5-5.5 ppm) and 4.27 ppm in hatching-failure eggs (range 3.1-5.5 ppm).

Bottom-line Conclusion:

Based on the results of various studies, and taking into account the variability associated with the studies, mean DDE concentrations less than 10 ppm have been associated with eggshell thinning of at least 15%, and mean DDE concentrations of 10 ppm have been associated with eggshell thinning of 20% or impaired reproduction in more than one study.

Hope that helps. I don't think his criticisms of the NIWQP report should have a bearing on what the threshold value for cormorant or tern eggs should be. The only cormorant study included in the table he's criticizing is reported accurately there.

Harry O.

Harry Ohlendorf
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From: <Tim_Kubiak@fws.gov>
To: "Terri Reeder" <treeder@waterboards.ca.gov>
Date: 2/15/2007 10:55:00 AM
Subject: Re: Newport Bay OCs TMDLs Targets, Katie's preliminary risk assessment, etc.

Terri,

You can solve for DDT tissue (as the unknown) for osprey or peregrine or bald eagle using the derivation equations in these criteria. Results can be compared to each of the tissue values being considered for your TMDL. As I said to you this morning, these three criteria were not approved by the State of New Jersey or promulgated EPA due to "implementation problems." They are consensus derivations that are technically justified by all the agencies. ESA compliance issue is still outstanding.

(See attached file: WildlifeCriteria_NJ_9_01.pdf)

Looking quickly at Byard's DDT analysis, I would caution on accepting the argument that the only assessment endpoint is hatching success, not shell thinning or for that matter any other endpoint, like nest productivity, or number of fledged young/nest. It would be equivalent to birth rates being OK and sudden infant death being of no consequence in human epidemiology. All these endpoints can cumulatively affect overall population stability, which DDT clearly did.

Regarding CCME DTT Tissue of 14 ug/kg, keep in mind the smallest species in your watershed likely to suffer from DDT will be controlling because of the allometrics. Smaller raptors will probably drive risk using their methods. Do you have merlins, or others in play that are water associated?

If I find some more information after reviewing your materials, I'll pass it along.

Tim

Timothy Kubiak
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Web: <http://njfieldoffice.fws.gov/>

From: <Katie_Zeeman@fws.gov>
To: "Kathy Rose" <krose@waterboards.ca.gov>
Date: 2/7/2007 4:37:14 PM
Subject: Re: Review of Jim Byard Commentary

Kathy,

Thank you for forwarding the seven documents (Appendices B through H) with commentary on guidelines and criteria used by the Santa Ana Regional Water Quality Control Board (SARWQCB) to establish total maximum daily loads (TMDLs) for DDT, and other organochlorine compounds (OCs) in San Diego Creek and Newport Bay. The documents provide comments and recommendations on the following:

- 1) (Appendix B) The U.S. EPA Water Quality Criterion for DDT to protect wildlife, specifically the brown pelican;
- 2) (Appendix C) The 1972 National Academy of Sciences DDT guidance in fish for the protection of wildlife, with emphasis on the osprey as a raptor that feeds in both marine and freshwater systems;
- 3) (Appendix D) The effects of DDT on reproduction in cormorants and terns;
- 4) (Appendix E) Data on DDT in mammals of potential importance to Newport Bay;
- 5) (Appendix F) The sediment TELs for total DDT;
- 6) (Appendix G) The Canadian tissue residue guideline for DDT; and,
- 7) (Appendix H) The California OEHHA sport fish guidance for DDT.

The aforementioned documents were presented along with verbal comments to the SARWQCB at a December 1, 2006 workshop for a review of provisions to incorporate total maximum daily loads (TMDLs) for OCs for San Diego Creek, Upper Newport Bay, and Lower Newport Bay into the Water Quality Control Plan for the Santa Ana River basin. The subject comments are in response to the November 17, 2006 draft technical report titled "Total maximum daily loads for organochlorine compounds - San Diego Creek, Upper and Lower Newport Bay, Orange County, California" (TMDL technical report). Comments in all but one of the appendices are from Dr. James Byard. It is my understanding that Dr. Byard's comments were presented on behalf of the Irvine Company and possibly other stakeholders in the San Diego Creek watershed.

Ideally TMDLs will be established that support designated beneficial uses related to wildlife. My concerns are for fish, wildlife, plants and their habitats in general. There is an added level of concern for migratory birds, and threatened or endangered species that may be present in the system. Comments presented in Appendices B - H include recommendations for

avian egg and fish tissue benchmarks for DDT that are different from those used to establish existing water quality criteria, and as such warrant a response. While formal comments on the technical TMDL report are forthcoming, this message is for responses to comments by Dr. Byard, especially those pertaining to guidelines, criteria and proposed benchmark effect levels for DDT and metabolites in eggs and prey of avian species. Time does not allow for a detailed discussion of individual points. But, I have identified a number of general issues, which are discussed below.

General Comments/Responses

1. First, a detailed re-analysis and update of the data on DDT effect levels in fish and wildlife is welcome. Such endeavors are best conducted through a process that includes coordination with other agencies and peer review, particularly if the conclusions are to be used for developing criteria. The process, which should entail compilation and analysis of all the relevant literature, requires a commitment of time and resources beyond what is available before the TMDLs are to be adopted. It may be desirable to consider mechanisms for supporting a detailed review of the literature in the future.
2. Comments in the appendices pertain to DDT (parent compound) and its principal metabolites (DDE and DDD), particularly DDE. Accordingly, my responses are focused on DDT and metabolites, even though TMDLs are being considered for other OCs as well. The other OCs will be addressed in formal comments on the technical TMDL report.
3. Standards for DDT need to be for both parent compound and metabolites, expressed as total DDT (DDTr). That eggshell thinning has been related primarily to DDE does not eliminate concerns about the presence of DDT or DDD, partly because; 1) DDT is a source of DDE; and, 2) DDT and DDD also produce adverse effects in exposed birds (Blus 1996). Reduced hatchability and post-hatch survival of chicks, and thereby reduced nest success have been observed with sensitive avian species exposed to DDT alone. Data on avian toxicity of DDD alone are limited. However, DDD is associated with lethality in adult birds, and until shown otherwise, DDD is presumed to be a contributor to toxic effects observed in studies that report effect levels for DDTr, or DDT (isomers unspecified) without providing data on concentrations of the individual isomers. Overall, while there may be sufficient data to develop a criterion for DDE based on eggshell thinning, criteria for DDTr are important to address uncertainty about toxic effects of the mixture as a whole.
4. Comments in a number of appendices suggest that water and sediment criteria for protection of avian wildlife in the San Diego

Creek/Newport Bay system should be species-specific. For example, current National and State water quality criteria for DDT in avian species are based on NOELs for pelicans. However, in Appendix C and Appendix G, the osprey is presented as a better representative for birds that consume fish in freshwater systems, and a dietary NOEL specific to the osprey is recommended for deriving criteria in San Diego Creek.

Response - Water and sediment criteria established to protect designated wildlife beneficial uses need to be generic in nature. Criteria are derived to protect most if not all potentially exposed receptors in a variety of aquatic systems. For any specific water body, little may be known about all the species that are present, and even less may be known about the sensitivities of those species to contaminants of concern. Consequently, criteria need to be intentionally conservative to address uncertainty about sensitivities and exposure potential for the species that may be present. The uncertainty is often addressed by combining a No Observed Effect Level (NOEL) for a representative sensitive species, with exposure factors for a representative highly exposed species. With DDT, the osprey may represent sensitive avian species that consume fish from freshwater systems, but it is not necessarily a good representative of highly exposed species. Larger animals consume less food per kg of body weight per day than smaller animals. Because of differences in food consumption rates, the dietary NOEL for an osprey may be more than double what the dietary NOEL would be for a bird the size of a kingfisher, which is a smaller species with the same feeding habits. Ideally, the sediment and water criteria used for establishing TMDLs for OCs in San Diego Creek and Newport Bay will be derived with generic sensitive and highly exposed receptors in mind. In so doing, the TMDLs will help to support the recovery of threatened or endangered species as well as prevent impacts in other sensitive species that rely on habitats and food supply offered by San Diego Creek and Newport Bay.

5. Questions were raised about what concentrations of DDT in bird eggs or diet constitute NOELs, as opposed to Low Observed Effect Levels (LOELs). Before responding to comments on NOELs, it is important to note that they are the values of choice over LOELs because they are concentrations below which no adverse effects are expected to occur in sensitive species. Criteria based on NOELs help ensure that subsequent management actions will support the recovery of threatened or endangered species and prevent impacts on other sensitive species. If a federally threatened or endangered species is among the potentially exposed receptors, impacts on individuals alone are cause for concern, making the selection of an appropriate NOEL even more

important. It is recognized that NOELs are not precise values, and there is often uncertainty about how well a NOEL from studies on one species represents NOELs for sensitive species in general under natural conditions. Uncertainties about the available data need to be considered when selecting a NOEL from which criteria are to be derived (e.g., see comments 7- 9).

6. Comments in Appendices B, C, D and G suggest that the only meaningful NOELs for avian species are those related to population decline, reduced hatching success, and critical eggshell thinning, which is the percent thinning associated with population decline (e.g., >15% for pelicans).

Response - The aforementioned are severe and population-level effects. Criteria based on such severe effects may not protect against other sensitive effects. For example, shell strength may be significantly compromised at DDE concentrations below a NOEL for critical levels of eggshell thinning (Henny and Bennett 1990). Any amount of eggshell thinning may be considered an adverse effect for species that are particularly susceptible to DDT-related eggshell thinning. More sensitive effects for species that are less susceptible to DDT-related eggshell thinning (e.g., gulls) might include reduced embryo survival, poor post-hatch survival and developmental abnormalities that affect the ability to breed as adults. An update and review of the data on the effects of DDT and its metabolites would help determine if there are measures of adverse effects other than population decline, reduced nest success or critical eggshell thinning that should be considered when identifying NOELs for sensitive avian species.

Response to comments in Appendix B - NOELs for DDT in pelican eggs and diet

7. It is suggested In Appendix B that a DDT concentration of 0.150 parts per million (ppm, wet weight) in fish tissue is a NOEL (not a LOEL) for adverse effects in pelicans, and should be the basis of criteria designed to protect sensitive marine species. The currently used value is 0.050 ppm.

National and state criteria for DDT in surface water for wildlife protection are based on a fish tissue benchmark from data presented by Anderson et al. (1975). The benchmark is a dietary concentration associated with reduced hatching success in the brown pelican, and it is based on data from samples collected in 1974. In 1980, a fish tissue concentration of 0.150 ppm from Anderson et al. (1975) was used by the U. S. Environmental Protection Agency (USEPA) as a LOEL to establish surface water quality criteria for marine and freshwater

systems (USEPA 1980). Later USEPA (1995) derived criteria for the Great Lakes using the same LOEL as before, adjusted downward by a factor of three to account for uncertainty about what the NOEL would be if one had been measured. It was recognized that the fish tissue NOEL could be higher, because the effects observed with pelicans in 1974 may be due to exposure to higher DDT levels in fish consumed before 1974. The data from Anderson et al. (1975) were collected between 1969 and 1974, which is a period that encompassed the cessation of DDT releases in 1970, and subsequent rapid declines in the environment and biota. It is suggested in Appendix B that if the DDE body burdens in pelicans had reached steady state at the time samples were collected in 1974, concentrations in pelican eggs would have been 27-times lower than those measured in 1969, as was observed with fish. The projected DDE concentration in eggs (1.7 ppm) would have been below concentrations associated with population decline, nest productivity might have been at levels needed to maintain a healthy population, and the corresponding concentration in fish (0.150 ppm) would have been considered a NOEL. The projected concentration for DDTr in pelican eggs would have been below the benchmarks as well.

Response - Although DDT concentrations measured in samples from 1974 may not represent steady state conditions, samples collected in 1969 when DDT releases into the environment were ongoing and had been so for decades, probably do. Anderson et al. (1975) provide data from 1969. At that time DDT concentrations in pelican eggs were approximately 18 times higher than DDT concentrations in the pelican diet. If a fish-to-egg biomagnification factor (BMF) of 18 is used, the DDT concentration measured in fish in 1974 (0.150 ppm) would correspond with a concentration of 2.7 ppm in pelican eggs, which is in the range associated with decrease in nest success (see comment 8), making 0.150 ppm DDT in fish tissue a LOEL, as suggested by USEPA (1995), and not a NOEL. A study to obtain data representing current conditions might help resolve this issue, if so desired.

8. A DDE concentration of 2.5 ppm in eggs was used in Appendix B to represent a NOEL for reduced nest success in pelicans.

Response - The selected benchmark leaves little room for safety, as it is just below ranges at which significant impacts on nest success have been observed. Ranges of effect levels observed with pelicans have been summarized by Blus (1984) as follows:

- a) 3.0 ppm is the lowest level of DDE in eggs that would result in severely lowered reproductive success and population decline if continued over years;
- b) Total reproductive failure occurred when DDE residues in eggs

- exceeded 3.7 ppm;
- c) There was a small decrease in nest success when DDE concentrations were between 2.0 ppm and 3.0 ppm (mostly with concentrations between 2.6 ppm and 3.0 ppm); and,
 - d) The percent of successful nests associated with concentrations below 2.0 ppm could not be distinguished from percent nest success observed with DDE concentrations below the analytical detection limit.

Although observations by Blus (1984) indicate there is a threshold, the severity of the effect and the steepness of the concentration-response curve, once the threshold is exceeded raises serious concern about considering 2.5 ppm a NOEL for DDE levels in pelican eggs. If the SARWQCB is planning to adopt criteria based on DDT concentrations in eggs of sensitive avian species, it is recommended that a lower value be considered which allows for uncertainty about data variability around the NOEL and the possibility for adverse effects related to lower levels of exposure (see comment 6).

- 9. It is concluded in Appendix B that exposure by pelicans to DDT from the Palos Verdes Shelf far outweighs their exposure to DDT from sources on San Diego Creek, and therefore that contributions from sources on San Diego Creek will be essentially undetectable.

Response - In general, the relative contributions of various sources to overall contaminant exposure should not be a factor when assessing risk. Instead, it may be a risk management issue that requires information on factors such as how DDT from San Diego Creek is distributed in the system and bird foraging patterns.

Response to comments on Appendix C - 1972 NAS DDT guidance and NOELs for the osprey

- 10 A fish tissue benchmark of 0.150 ppm for ospreys is recommended as an alternative to the 1972 National Academy of Sciences DDT guidance in fish for the protection of wildlife (freshwater and marine). The suggested benchmark was based on a DDE concentration in osprey eggs associated with reduced hatching success (3.0 ppm), divided by a factor of two, and again by a BMF of ten. Presumably, the osprey represents sensitive piscivorous raptors that feed in both freshwater and marine systems.

Response - Be aware that the fish tissue guideline for the osprey is effectively considered a guideline for sensitive avian species in general if it is used to establish criteria for DDT in water and

sediment (see comment 4). Before agreeing to use the suggested benchmark, it is recommended that the SARWQCB review the literature to confirm that the osprey represents sensitive piscivorous species in general (see comment 4), and to ensure that the selected benchmark addresses concerns about effects other than critical eggshell thinning or reduced nest productivity (see comment 6), highly exposed species that may be present in the system (see comment 4), and uncertainty about NOELs for DDE concentrations in eggs (see comment 8). My initial response to the suggested benchmark is to agree that ospreys are among the more sensitive species for eggshell thinning. But, the concerns that were expressed about NOELs and fish tissue guidelines for pelicans, apply to ospreys as well. In addition, a fish tissue guideline for ospreys may have to be adjusted downward to account for exposure by smaller species in the same feeding guild.

Comments on Appendix D - effects of DDT on reproduction in cormorants and terns.

11. A number of questions were raised about a Department of the Interior Publication titled "Guidelines for Interpretation of the Biological Effects of Selected Constituents in Biota, Water, and Sediment" (DOI guideline document). The document, which was finalized in 1998, was developed for the National Irrigation Water Quality Program. In it, various authors compiled and summarized the available data on selected contaminants, including DDT. It is cautioned in the document that values presented in summary tables are designed to give only a general indication of concentrations that may be troublesome in various types of media. It is my experience that the document is used as a starting point to help identify possible effect levels that will be researched further in the primary literature.

Comments on the DOI guideline document are about the chapter on DDT, particularly mistakes and "misrepresentations of published scientific literature" in summary Table 16.

Response - I cannot respond in detail to these questions because I was not involved in the development of the document. Questions about how data were interpreted would best be answered by contacting the author directly. According to the document, the author is Harry Ohlendorf of CH2M Hill. Questions about mistakes are only effectively addressed during the review process, which was nearly ten years ago. It is recognized that mistakes such as missing or incorrect citations are frustrating for the reader and the author. Such mistakes are almost inevitable in reports where results of large numbers of studies are to be boiled down to a few pages of text or entries in a table. Unfortunately, even with the most meticulous review, some mistakes may

not be discovered until after the document has been released to the public, just as I am sure it was found that there is a missing reference (Anderson et al. 1977) in the commentary presented in Appendix B.

12. The main purpose of commentary in Appendix D appears to be to demonstrate that cormorants and terns are less sensitive to the eggshell thinning effects of DDE, than are pelicans and ospreys. A specific conclusion is that for cormorants and terns DDE in eggs must exceed 10 ppm to result in critical eggshell thinning (>15%) and significant hatching failure.

Response - It is generally recognized that there are species differences in sensitivity to DDE-associated shell thinning (Blus 1996). As indicated previously, a comprehensive review of the literature would be welcome and may support conclusions about the sensitivity of cormorants and terns to DDE. It is important to note, however, that if terns and cormorants are less sensitive than other species, they would not be considered appropriate receptors upon which to base criteria for water and sediment (see comment 4). In addition, concerns raised about identifying benchmarks for pelicans (e.g., see comments 6 and 8) and ospreys (e.g., see comment 10) would also have to be addressed when evaluating the data on terns and cormorants.

Comments on Appendix E - an analysis of risks posed by DDT from San Diego Creek to marine mammals in Newport Bay

13. Dr. Ronald Tjeerdema reviewed the available data on marine mammals that reside in or visit Newport Bay. The species that he considered were the California sea lion, harbor seal, three species of dolphins and two species of whales.

Response - The marine species are trust resources of the National Oceanic and Atmospheric Administration (NOAA), and I defer to that agency for detailed comments on Dr. Tjeerdema's analysis. However, other, land-based mammals that rely on aquatic invertebrates or fish for food are likely to be present in the system. For San Diego Creek and Newport Bay, one such receptor is the raccoon. Smaller species that rely on aquatic biota for food (e.g., certain shrews), or potentially more sensitive species (e.g., mink) are not expected to be present. Concerns about mammals in general are limited because they tend to be less sensitive to DDT than birds, and criteria developed to protect against adverse effects in avian species are expected to be protective of mammalian species as well. Consequently, I have no comments at this time on risks posed by DDT in San Diego Creek or

Newport Bay to land-based mammals that rely on aquatic biota for food. Please note that if evidence becomes available that small piscivorous mammals are present, it may be necessary to consider them as a source of dietary exposure by raptors.

Comments on Appendix F - Sediment threshold effect levels (TELs) for total DDT

14. Comments in Appendix F suggest that because of how they are derived, TELs are over-protective as guidelines.

Response - It is understood that NOAA, and others will be responding to comments on how the TELs are derived and their efficacy as indicators of potential for impacts on the benthic invertebrate community. Consequently, my responses are limited to the following.

In general, the sediment TELs are used to help evaluate the potential impacts of contaminants on the benthic invertebrate community, which is important in and of itself, as well as a source of food for fish and wildlife. The TELs and other similarly derived values are guidelines for the protection of directly exposed benthic invertebrates. As such, they do not address risks to directly exposed bottom-dwelling fish. In addition, they do not address bioaccumulation of substances such as DDT and other OCs. While it may be suggested in Appendix F that benchmarks such as TELs are overly protective of benthic invertebrates, my concern is that they do not address risks to bottom dwelling vertebrates and for bioaccumulative substances, they are not protective of upper trophic level members of the community.

15. Receptors potentially exposed to DDT from San Diego Creek and Newport Bay are identified in the conceptual model. The conceptual model used in Appendix F does not adequately reflect exposure routes and receptors that need to be considered, at least initially. Categories of avian receptors to consider for the DDT in San Diego Creek include birds that consume freshwater fish and birds that consume emergent insects. Categories of avian receptors to consider for DDT in Newport Bay include birds that consume benthic invertebrates and birds that consume estuarine/marine fish. If there are higher trophic level feeders (e.g., species that consume fish-eating birds or small fish-eating mammals) in either system they should be considered as well.

Comments on Appendix G - the Canadian tissue residue guideline for DDT

Comments in Appendix G pertain to details in the protocol used for

developing the Canadian fish tissue guideline for wildlife. The guideline is based on a NOEL for eggshell thinning in ducks, combined with the food ingestion rate for a storm petrel. Such protocols incorporate both technical observations and policy considerations. Consequently, comments on details of the protocol are best addressed by the authors. Three general issues were raised to which I have responses.

16. it is mentioned in Appendix G that Canada based their guideline on LOELs for ducks, without considering the data on raptors.

Response - It is desirable to base criteria on NOELs for sensitive receptors in general. The daily exposure rate used to represent the NOEL for effects in ducks was stated to be the lowest found, suggesting that the duck is a sensitive avian receptor. Whether or not a raptor should be used instead can only be determined by making between species comparisons for the same level of effect (e.g., thinning versus critical thinning) and measures of exposure that adjust for receptor size (e.g., as mgDDT/kgBW-day).

17. Questions were raised about using eggshell thinning rather than hatching failure as the adverse effect upon which criteria were based.

Response - Eggshell thinning is an effect of DDE exposure, and an agency may elect to consider any amount of thinning as the adverse effect of concern (see comment 6).

18. Comments in Appendix G suggest that it is inappropriate to use exposure factors for a petrel to estimate maximum food intake rate for sensitive avian species, because petrels are not as sensitive to DDT as other species such as the osprey.

Response - Because of how they are used, criteria are based on risks to sensitive and potentially most exposed receptors (see comment 4). The exposure factors for the storm petrel represent exposure factors for small piscivorous birds.

An alternative fish tissue benchmark was calculated in Appendix G using dose-response data for the sparrow hawk, a threshold for hatching failure and exposure rate for the osprey. My initial response to the suggested value is that: 1) a detailed review of the literature may result in the selection of dose-response data for a species other than those already used (but not necessarily the sparrow hawk); 2) using hatching failure as the measure of an effect may be imprudent (comment 6); and, 3) using exposure factors for the osprey would be inappropriate for systems that support smaller species with

the same feeding habits (comment 4).

Comments on Appendix H - the State sport fish guidance for DDT

19. Comments in Appendix H pertain to how the State Office of Environmental Health Hazard Assessment fish tissue guidance was used by SARWQCB and USEPA to determine that sport fishing in Newport Bay was impaired. Clearly, these are comments that are best addressed by SARWQCB, USEPA and perhaps OEHH staff.

Overall, Dr. Byard raised issues about what species best represent important receptor groups, and what would be meaningful effect levels upon which criteria may be based. These are issues that may be resolved through a comprehensive and collaborative review of the literature (see comment 1), which I welcome. However, efforts to refine benchmarks need to consider that criteria are for generic receptors (comment 4), and they need to address concerns such as those expressed in comments 5, 6, 8, 10 and others.

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Dear Ms Reeder,

The National Oceanic and Atmospheric Administration (NOAA), Office of Response and Restoration, appreciates the opportunity to comment on Appendices B through H, and the associated commentary on guidelines and criteria used by the Santa Ana Regional Water Quality Control Board (SARWQCB) to establish total maximum daily loads for DDT and other organochloride compounds in San Diego Creek and Newport Bay. Also, thank you for including the comments already submitted by Dr. Katie Zeeman of the U.S. Fish and Wildlife Service and Donald D. MacDonald of MacDonald Environmental Sciences Ltd.

I concur with the responses of both Zeeman and MacDonald to these documents. Since these two sets of comments to the SARWQCB cover many of NOAA's concerns, I will keep my comments brief rather than go over the same issues already covered by these respected colleagues. I would like to reinforce Zeeman's comments on the need to be conservative when site specific information is unavailable, and I agree with Zeeman on the need for a thorough evaluation of all existing data, followed by peer review, before modifying any existing guidelines.

In his letter, MacDonald gave a clear and concise explanation of the development and appropriate uses of Threshold Effects Levels (TELs) and Threshold Effects Concentrations (TECs) as well as clear responses to the flawed analysis and interpretation of the TELs and TECs contained in the appendices. Having worked in the field of environmental risk assessment for over twenty years, with particular emphasis on sediment contamination issues, I can safely say that currently the best guidelines we have for evaluating sediment toxicity without site specific data are the TELs and Probable Effects Levels (PELs); TECs and Probable Effects Concentrations (PECs); and the Effects Range Low (ERLs) and Effects Range Median (ERMs). The ERLs/ERMs are guidelines for marine sediments developed by NOAA in a similar manner as the TELs/PELs. The choice of whether to use ERLs/ERMs or their equivalent TELs/PELs in the marine environment is a judgement call; sometimes the ERLs/ERMs have higher values and sometimes lower values than the TELs/PELs. It is important to remember that these are just guidelines to be used when no site specific effects data are available. It is completely appropriate to use them as interim values as proposed by the SARWQCB until such time that site specific data becomes available.



Appendix E is an adequate review by R.S Tjeerdema of the scientific literature regarding the potential for effects from DDT and it's metabolites on marine mammals. I agree with Tjeerdema, that due to lack of data on any effects of DDTs on marine mammals, they are not a likely driver for the determination of DDT TMDLs in Newport Bay and San Diego Creek. Tjeerdema also points out the transitory nature of visits to the Bay area by marine mammals and the fact that marine mammals can accumulate DDT and other organics in the metabolically inactive blubber. Any contaminants taken up by cetaceans or pinnipeds while visiting Newport Bay will probably be stored in their blubber along with contaminants taken up from other locations. As long as the contaminants remain in the blubber they are unlikely to pose a problem to the organism, however, during times of fasting (due to e.g., food shortage, behavior patterns or care of young) these contaminants may be released in sufficient concentrations to pose a problem to the organism. It may be reasonable to assume that developing TMDLs for DDTs that would be protective of other piscivorous mammals would also be protective of marine mammals, however, direct effects on marine mammals would need to be considered if PCBs (which have been related to reproductive problems in seals (Reijnders, 1986)) and dioxins (which act similarly to PCBs) are an issue.

Finally I'd like to address in some detail the review by J.L. Bryard of the National Academy of Sciences (NAS) fish tissue recommendations. Bryard's commentary is presented in Appendix C.

Page 4: Bryard states that the NAS summary didn't say that ospreys tend to feed along coasts and up estuaries resulting in a fish diet quite different from the terns in Hays and Risebrough (1972). In support of this statement, Bryard sites Green et al. (1983). However, Dr. Bryard failed to point out that the principal species in the ospreys' diet according to Green et al. (1983), while not the same as the tern prey species, are quite similar in general feeding habits and foraging range as indicated in Table 1, shown below. A few salient points of this similarity between the two groups of species are:

- smelt and alewife (osprey prey) are both anadromous, as is the blueback herring (tern prey);
- the blueback herring is of the same genus as the alewife and they are often mistaken for each other;
- both the pollock and winter flounder (osprey prey) occur offshore and inshore and can be found in bays and estuaries, which can be said for most of the tern prey species; and
- winter flounder are known to sometimes spawn in bays and estuaries, as are the Atlantic menhaden, Atlantic silversides and bay anchovy, which are all tern prey species.

Table 1 Osprey and tern prey species from Green et al., 1983 and Hays and Risebrough, 1972.

Common name	Scientific name	General information
Pollock ¹	<i>Pollachius virens</i>	occur inshore and offshore
Winter flounder ¹	<i>Pseudopleuronectes americanus</i>	prefer 1-20 fathoms, may spawn in bays and estuaries where young of the year remain.
Smelt ¹	<i>Osmerus mordax</i>	anadromous, inshore species, spawns freshwater
Alewife ¹	<i>Alosa pseudoharengus</i>	anadromous, spawning in late April–May, can be confused with blueback herring
Blueback herring ²	<i>Alosa aestivalis</i>	anadromous, spawning in June
Atlantic herring ²	<i>Clupea harengus</i>	spawning may occur inshore
Atlantic round herring ²	<i>Etrumeus sadina</i>	
Atlantic menhaden ²	<i>Brevoortia tyrannus</i>	occurs both inshore and offshore, spawning in New England may occur in coastal embayments.
Atlantic silverside ²	<i>Menidia, menidia</i>	occurs in shoals close to shore and in brackish water also called sand smelt, spawn in intertidal zone of estuaries and tributaries.
White perch ²	<i>Morone americanus</i>	Primarily found in brackish water but common in pools and other quiet water areas of medium to large rivers, usually over mud.
Atlantic mackerel ²	<i>Scomber scombrus</i>	generally a pelagic species that may move inshore during the summer
Bay anchovy ²	<i>Anchoa mitchelli</i>	chiefly occurs along sandy beaches and the mouths of rivers

¹ Osprey prey from Green et al., 1983

² Tern prey from Hays and Risebrough, 1972

Therefore, while the list of prey species for osprey and tern from the two different studies are not the same, they are certainly similar enough for the tern prey species to act as surrogates for the osprey prey species.

Page 5. Bryard goes on to say “One could conclude from this [Green et al. (1983)] and other studies [which he doesn’t specify] that ospreys often catch fish in fresh or brackish water and, therefore, may not have been the best species for assessing the reproductive effect of DDT residues in marine fish.” He seems to be unaware that all four principal prey species in Green et al. (1983) are marine species which spend

most of their lives in the marine environment, entering brackish or freshwater environments only for relatively short periods. Furthermore, immediately above his statement, in the section of Green et al., (1986) that he cut and pasted into his review, the incidental prey items mentioned are also all marine species, and it also goes on to state that fisherman have reported osprey fishing for mackerel (one of the tern prey items) up to 1.5 km offshore. Another point of interest, Green et al., (1986) indicated the principal osprey prey species in May were smelt and alewife. Smelt and alewife spawn in April and May, so the fish the osprey were feeding on were moving from the marine environment to a freshwater riverine environment, and therefore any DDT present in their tissues would likely have been derived from the marine environment. All this indicates that the osprey studied by Green et al. (1983) had a predominantly marine fish diet.

Bryard states that fish from the Connecticut River had much higher DDT concentrations than fish cast from the tern nests and this should have been taken into account in the NAS report. The NAS report was dealing with residues in marine fish, and the Connecticut River data Bryard cites does not give species, so the data may not be relevant to marine species. Furthermore, ospreys along the Connecticut River were having reproductive problems associated with DDT, and the NAS was trying to derive a protective or no effect level of fish tissue residues.

There is no indication in the data presented by Dr Bryard that the NAS advisory panel for marine fish erred in their determination that, based on the data available to them at the time, a 50 ppb DDT residue in marine fish tissue would be protective of higher trophic level species.

Following his review of the NAS panel findings, Bryard goes on to review studies conducted since those findings to try and justify a higher fish tissue concentration. While the studies cited clearly show an increase in osprey populations, the variability in fish and egg chemistry cause them to be equivocal with regards to a protective fish tissue concentration. Even if the presented data supported a change in the recommended protective fish tissue levels for osprey, it would still need to be determined that the higher level was still protective for all or at least most species, since the original recommendation used the osprey as a surrogate for all fish eating species. This type of review and determination is best done by a panel of experts followed by peer review, not by an individual.

Without quality data for Newport Bay and San Diego Creek the SARWQCB is right in its judgment to use conservative values from the literature as interim criteria until site specific data can be obtained.

Sincerely,
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Dear Dr. Reeder:

Thank you for the opportunity to conduct a brief review of the Total Maximum Daily Loads (TMDLs) for Organochlorine Compounds (Rose 2006) and associated documentation. From the information provided, I understand that the Santa Ana Regional Water Quality Control Board (SARWQCB) is currently in the process of developing TMDLs for organochlorine compounds in San Diego Creek and Upper and Lower Newport Bay, California. I further understand that the TMDLs for DDTs are based, in part, on sediment targets that rely upon the threshold effect levels (TELs) from MacDonald *et al.* (1996). The underlying assumption is that beneficial uses will be protected from negative impacts if the sediment targets for DDTs are met in San Diego Creek and Upper and Lower Newport Bay.

For the record, neither I nor my firm (MacDonald Environmental Sciences Ltd.; MESL) have been retained by the SARWQCB or, to the best of my knowledge, any other party involved in the discussions regarding the TMDLs for these waterbodies. However, MESL supplied the information in the BEDs to Dr. Byard, at our usual rate for accessing the database. In addition, neither I nor my firm have any financial or other interest in the outcome of this dispute, except to assist the parties in better understanding the scientific basis of the TELs and their applications for deriving TMDLs. I have also briefly reviewed the documentation prepared by Andrew R. Henderson (General Counsel, Building Industry Legal Defense Foundation; i.e., Letter to Dr. Kathy L. Rose, dated January 12, 2007) and have provided a brief response to these comments as well.

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1.0 Development and Evaluation of Threshold Effect Levels

MacDonald *et al.* (1996) used a weight-of-evidence approach to develop biological-effects based sediment quality guidelines (SQGs) for a total of 34 substances for evaluating sediment quality conditions in marine and estuarine ecosystems. For each substance, a TEL and a probable effects level (PEL) was calculated. These two values defined three ranges of chemical concentrations, including:

- < TEL: Adverse effects on sediment-dwelling organisms rarely observed;
- TEL - PEL: Adverse effects on sediment-dwelling organisms occasionally observed; and,
- > PEL: Adverse effects on sediment-dwelling organisms frequently observed.

The SQGs were then evaluated to determine their comparability (i.e., the extent to which they agreed with other SQGs with similar narrative intent), their reliability (i.e., as determined by calculating the percent incidence of adverse effects within each concentration range using the database utilized to derive the SQGs), and their predictive ability (as determined by calculating the percent incidence of adverse effects within each concentration range using an independent database). Similar TELs and PELs were derived subsequently to support evaluations of sediment quality guidelines in freshwater ecosystems (Smith *et al.* 1996). More recently, MacDonald *et al.* (2000) derived consensus-based sediment effect concentrations, including a threshold effect concentration (TECs) and a probable effect concentration (PEC), that provide a unifying synthesis of the published SQGs for freshwater sediments. The consensus-based SQGs have also been evaluated to determine if they provide an accurate basis for predicting the presence and absence of sediment toxicity.

The SQGs that were derived by MacDonald *et al.* (1996) included TELs of 1.22, 2.07, 1.19, and 3.89 $\mu\text{g/kg DW}$ for p,p'-DDD, p,p'-DDE, p,p'-DDT, and total DDTs (i.e., sum of six DDT isomers), respectively. The results of the comparability evaluation indicated that these TELs were similar to two other SQGs, including effects range-low (ER-L; Long *et al.* 1995) and the equilibrium-partitioning based sediment quality criterion (Lyman *et al.* 1987; Pavlou 1987). The TELs for p,p'-DDD, p,p'-DDE, and p,p'-DDT were found to be highly reliable, as indicated by the low frequency of adverse biological effects (i.e., <10%) for sediment samples with concentrations of these substances below the TELs. The incidence of adverse biological effects was higher (i.e., 47.6%) for sediment samples with concentrations of total DDTs below the TEL, suggesting that a lower TEL would have been more reliable. The incidence of toxicity to marine amphipods, mysids, and/or sea urchins was 7% in sediment samples from the southeastern portion of the United States that had no exceedances of the TELs for the 34 substances considered (n=70). Overall, these results demonstrate that the TELs provide an accurate basis for identifying sediment samples that are unlikely to be

toxic to sediment-dwelling organisms. Virtually all of the sediments considered in the evaluations of the reliability and predictive ability of the TELs contained DDTs in complex mixtures with other chemical substances (e.g., metals, PAHs, etc.). Therefore, the TELs are considered to provide useful tools for identifying sediment quality conditions that are likely to be supportive of healthy, self-sustaining populations of benthic invertebrates in urban embayments that frequently have complex mixtures of various chemicals in the sediments.

As indicated above, MacDonald *et al.* (2000) derived consensus-based TECs and PECs for metals, PAHs, PCBs, and organochlorine pesticides in freshwater sediments. More specifically, TECs of 4.88, 3.16, 4.16, and 5.28 $\mu\text{g/kg DW}$ for p,p'-DDD, p,p'-DDE, p,p'-DDT, and total DDTs, respectively. The predictive ability of these SQGs was subsequently evaluated by these investigators. The results of this evaluation showed that sediment samples with concentrations of these substances below the TEC were found to be toxic to amphipods, mayflies, midge, oligochaetes, daphnids, and/or bacteria (i.e., Microtox) only infrequently (i.e., sediment samples were correctly predicted to be not toxic in 77 to 83% of the sediment samples; $n = 96$ to 180). Therefore, the freshwater SQGs also provide an accurate basis for predicting the absence of toxicity to sediment-dwelling organisms.

In summary, the TELs for marine and estuarine ecosystems and the TELs and TECs for freshwater ecosystems were derived to provide sediment quality assessment tools that could be used to identify the concentrations of sediment-associated contaminants below which adverse effects on benthic communities are unlikely to be observed. The results of the evaluations of these SQGs confirm that they provide an accurate basis for identifying sediment samples that would not be toxic to sediment-dwelling organisms. It is important to note that MacDonald *et al.* (1996; 2000) and Smith *et al.* (1996) also developed tools for identifying the concentrations of sediment-associated contaminants above which adverse effects on benthic invertebrates are likely to be frequently observed (i.e., PELs and PECs). It is understood that these alternate assessment tools were not used to derive TMDLs for San Diego Creek and Upper and Lower Newport Bay because the sediment targets were intentionally selected to provide conservative TMDLs (i.e., TMDLs that would have a high probability of protecting the beneficial uses of these waterbodies).

2.0 Scientific Commentary on Sediment TELs for Total DDT

Recently, Byard (2006) prepared a scientific commentary on sediment TELs for total DDTs. More specifically, Byard (2006) reviewed the data and information contained in the Biological Effects Database for Sediments (BEDS), that was used to derive the sediment quality guidelines reported by MacDonald *et al.* (1996) and Smith *et al.* (1996). On the basis of this review, Byard (2006) reported that the data sets for freshwater and marine TELs were found to be erroneous due to many problems with individual data points,

including errors in interpretation of data points, repeated use of the same data points, use of outdated K_{oc} and K_{ow} values, arbitrary selection of data points, inconsistent correction for organic carbon, use of parent DDT data points for total DDT TELs, and use of low residue effect data points when higher data points were without effect. Byard (2006) further concluded that the TELs would have been much higher if the flaws had been corrected. Finally, Byard (2006) noted that the TELs rely primarily on co-occurrence of toxicity and DDTs in sediments and that the results of spiked-sediment toxicity tests and studies of benthic communities inhabiting highly contaminated sediments suggest that the toxicity thresholds for DDTs are more than two orders of magnitude higher than the TELs.

After reviewing the commentary provided by Byard (2006), it is apparent that the author either did not read or did not understand the detailed descriptions of the methods that were applied to develop the BEDS database. Briefly, the BEDS database represents a compilation of matching sediment chemistry and biological effects data from numerous studies conducted throughout North America. Over 350 reports were reviewed and critically evaluated for this purpose. These reports provided information from equilibrium-partitioning models, laboratory spiked-sediment toxicity tests, and field studies (i.e., both ambient-media toxicity tests and benthic invertebrate community assessments). Each record in the database includes the following information: data source (citation), endpoint measured, study area, test duration (if applicable and reported), and the concentrations of each chemical (expressed on a dry weight basis).

As indicated above, Byard (2006) identified a number of "errors" in the BEDS database that, if corrected, would result in higher TELs than those reported by MacDonald *et al.* (1996) and Smith *et al.* (1996). However, the "errors" identified by Byard (2006) are not really errors in the underlying data or in the database. Rather, the "errors" identified by Byard (2006) appear to reflect differences in the interpretation of the underlying data or differences in the analysis of those data. Some of the problems with the commentary include:

- Byard (2006) indicated that the original data sets were not memorialized and are, therefore, unavailable. This statement is false. All of the underlying data that were used to build the BEDS database are contained in our corporate headquarters in Nanaimo, B.C. In addition, the results of the evaluations of all of the candidate data sets are held at our corporate headquarters. Finally, all of the analyses conducted on individual data sets are permanently saved in a series of electronic files in MS Excel format. Dr. Byard requested the underlying data for several studies from us and they were provided to him.
- Byard (2006) indicated that the data sets for the freshwater and marine TELs were found to be erroneous due to many problems with individual data points.

Yet, Byard (2006) also indicated that the original data were unavailable. It is difficult to comprehend how problems with individual data points were identified without examining the underlying data in detail, understanding the decisions that were made regarding the interpretation of individual data sets, and replicating the analyses that were conducted. Without such a detailed understanding of the underlying data and associated interpretive decisions, Byard's (2006) conclusions should be viewed as conjecture.

- Byard (2006) reviewed the data in the freshwater BEDS and concluded that the underlying data for the Marking *et al.* (1981) study must be flawed because the ratios of DDD, DDE, and DDT that were measured were contrary to general findings that old residues of DDT are predominantly DDE. However, we reviewed the underlying data and determined that the GC-ECD method that was used to generate the sediment chemistry data is likely reliable. Therefore, we accepted the data as reported by the authors. Byard (2006) simply assumed that the underlying sediment chemistry data were wrong because they didn't agree with his assumption (i.e., that the DDTs must have been well-weathered). Making such assumptions is not consistent with the principles of scientific investigation.
- Byard (2006) indicated that, because the screening level concentrations (SLCs) that were derived for freshwater and saltwater were different, there is problem with the approach that was used to derive these SQGs. This comment belies a lack of understanding of the screening level concentration approach (SLCA). That is, SLCs are derived from matching sediment chemistry and benthic invertebrate community structure data collected in the field. The SLCs that are derived using data from freshwater and saltwater ecosystems would only be expected to be the same if the species that were considered in the evaluation had the same ranges of sensitivities to DDTs, if the levels of organic carbon in the two data sets were similar, and the underlying database was comprehensive (i.e., included the majority of the species that occur or ought to occur in the various ecosystems and included data collected in the vicinity of DDT sources).
- Byard (2006) concluded that the SQG derived by Hart *et al.* (1988) using the equilibrium-partitioning approach was too low because the wrong K_{oc} value was used in calculating the SQG. This comment suggests that Byard (2006) believes it is more reasonable to use a maximum K_{oc} value than an average K_{oc} value for deriving a SQG for DDTs. There is nothing intrinsically wrong with Byard's (2006) suggestion. It simply results in an estimate of one of the highest SQGs that could be derived using the approach. Hart *et al.* (1988) chose to employ a more conservative approach by utilizing a K_{oc} value that was more representative

of central tendency of the values reported in the literature. To me, this seems more reasonable than utilizing the outliers that were reported in the literature.

These are only a few examples of how Byard (2006) has re-interpreted the underlying information in the BEDS database. While I fully support the concept of considering alternate interpretations of the underlying data, I would expect that such re-interpretations would be based on in-depth reviews and evaluations of the underlying data rather than simply applying hypothesis and conjecture to cast doubts on the information that was used to derive the TELs and PELs.

Our publications regarding these SQGs describe the methods that were used to develop the BEDS database and to derive the SQGs. These methods were developed in conjunction with the Science Advisory Group on Sediment Quality Assessment (which includes nearly 50 experts and practitioners in the sediment quality assessment field). I don't doubt that there are other methods that could be used to compile and evaluate the data in the BEDS. However, we have developed and implemented consistent and reproducible methods that support the development of SQGs that are largely reliable and predictive of sediment toxicity.

3.0 Toxicity Thresholds for DDTs

The basic premise behind the commentary provided by Byard (2006) is that the TELs do not provide a basis for defining toxicity thresholds for DDTs. In fact, Byard (2006) appears to have expended substantial effort trying to demonstrate that the TELs are not toxicity thresholds for these substances. This is surprising because the TELs were never intended to be toxicity thresholds for DDTs (i.e., concentrations in sediments above which toxicity is expected to occur). Rather, the TELs are intended to define the concentrations of DDTs below which adverse effects on sediment-dwelling organisms are unlikely to be observed. By definition, toxicity thresholds for these substances would be higher.

There are a number of procedures that could be applied to define toxicity thresholds for DDTs. First, we have used empirical data to define the concentrations of DDTs that are frequently associated with adverse effects, when these substances occur in complex mixtures with other chemical contaminants (such as metals, PAHs, and PCBs). We have reported these toxicity thresholds as PELs in the literature (MacDonald *et al.* 1996; Smith *et al.* 1996). In addition, we have evaluated the reliability and predictive ability of these SQGs to provide practitioners with relevant information for determining the confidence that can be applied to assessments conducted using the PELs. Alternatively, the results of spiked-sediment toxicity tests and/or equilibrium-partitioning modeling could be used to

identify the concentrations of DDTs that cause toxicity to sediment-dwelling organisms when these substances alone occur in sediments. However, care must be taken when applying such toxicity thresholds to field conditions because field-collected sediments in the vicinity of urban areas usually contain complex mixtures of contaminants and such mixtures are virtually always more toxic than sediments that contain DDTs alone. Therefore, it is important to clearly articulate the narrative intent of sediment quality guidelines before selecting the values that are to be used in a particular application.

4.0 Protection of Beneficial Water Uses

As indicated previously, I understand that the TMDLs that are being developed for San Diego Creek and Newport Bay are intended to protect the beneficial uses of these water bodies. I further understand that such TMDLs ought to provide protection for benthic invertebrate communities, fish communities, aquatic-dependent wildlife, and human health. In my opinion, it would be reasonable to apply a weight-of evidence approach to the TMDL-development process that considers multiple lines-of-evidence that are generated on a site-specific basis, including:

- Surface-water chemistry;
- Pore-water chemistry;
- Pore-water toxicity;
- Whole-sediment chemistry;
- Whole-sediment toxicity;
- Benthic invertebrate community structure;
- Invertebrate-tissue chemistry; and/or,
- Fish-tissue chemistry.

As such a comprehensive, site-specific data set is not yet available, it is reasonable to establish preliminary TMDLs and associated targets for the various media types using more generic information that is more broadly applicable (i.e., applicable on a regional or national basis). For whole-sediment chemistry, such preliminary targets for DDTs can be established by reviewing and evaluating the available SQGs to identify values that are consistent with the objectives of the TMDLs. As the TMDLs appear to be intended to be protective of water uses in San Diego Creek and Newport Bay, it is not unreasonable to select SQGs that define the concentrations of DDTs that are unlikely to be associated with adverse biological effects. The TELs are consistent with that objective.

In addition to preventing against toxicity to sediment-dwelling organisms, the preliminary sediment targets should be established at levels that prevent against harmful levels of bioaccumulation in the food web. Importantly, such sediment targets should protect against adverse effects in aquatic-dependent wildlife associated with bioaccumulation of DDTs in the tissues of prey species. Anderson *et al.* (1975) reported that brown pelicans consuming anchovies with, on average, 0.15 mg/kg WW of DDT in their tissues had fledgling rates that were 30% lower than those required to maintain a stable population. Therefore, the concentrations of DDT in fish tissues should be lower than 0.15 mg/kg WW to support healthy populations of piscivorous birds. From these results, it is possible to assume that fish tissue concentrations of DDTs in the order of 0.1 mg/kg WW would be protective of fish-eating birds. USEPA (2000) reported BSAFs for DDT to range from 0.12 to 88.07 in various fish species exposed to various concentrations of DDT in various types of sediment. The geometric mean of these BSAFs is 2.68. Using this information and assuming that a sediment organic carbon level of 1% and a fish tissue lipid level of 10%, it is possible to establish a bioaccumulation-based sediment target using the following equation:

$$\begin{aligned}
 [\text{Sediment}] &= \frac{[\text{Tissue}]}{F_{\text{lipid}}} \times \frac{f_{\text{oc}}}{\text{BSAF}} \\
 &= \frac{0.1 \text{ mg/kg WW}}{0.1} \times \frac{0.01}{2.68} \\
 &= 0.0037 \text{ mg/kg} \\
 &= 3.7 \text{ } \mu\text{g/kg}
 \end{aligned}$$

Such a bioaccumulation-based sediment target is similar to the TELs that have been established for DDT. Similar calculations could be done for the other DDT isomers (DDD and DDE) to establish comparable sediment targets for these substances. It is likely that such bioaccumulation-based sediment targets would be protective of aquatic-dependent wildlife and human health associated with consumption of DDT-contaminated fish tissues.

5.0 Errors in the A.R. Henderson Submission

On January 12, 2007, A.R. Henderson, General Counsel for the Building Industry Legal Defense Fund, submitted a letter to Dr. K.L. Rose regarding the TMDLs for organochlorine compounds for San Diego Creek and Newport Bay. While I have not conducted a comprehensive review of this submission, I have noted a number of errors in fact that ought to be corrected for the record, including:

- Mr. Henderson indicated that I am a statistician rather than a scientist with any training in what levels of chemicals cause toxicity. This statement is false. In fact, I am an aquatic biologist, who specializes in ecological risk assessment and natural resource damage assessment in aquatic ecosystems. I am trained and have substantial experience in determining what levels of chemicals cause toxicity to aquatic organisms.
 - Mr. Henderson indicated that the SECs that were derived to support a natural resource damage assessment of the Palos Verdes shelf relied on data from the Southern California Bight and, hence should be interpreted to apply to the Southern California Bight. This statement is correct; the SECs are intended to apply to the Southern California Bight.
 - Mr. Henderson indicated that, because the SECs for the Southern California Bight were higher than the TELs derived previously, the applicability of the TELs to the Southern California Bight is in question. This statement is nonsense. The TELs and SECs are intended to serve two very different purposes. More specifically, the TELs define the concentrations of DDTs below which adverse effects on sediment-dwelling organisms are unlikely to be observed. In contrast, the SECs are intended to define the concentrations of DDTs above which adverse effects on sediment-dwelling organisms are likely to be frequently observed. That is, the SECs are intended to define toxicity thresholds of DDTs, while the TELs are intended to be conservative SQGs that are highly protective of the benthic community.
 - Mr. Henderson indicated that SECs were derived in a non-scientific and even misleading manner, as selected data from various studies were used. This statement is false and defamatory. The SECs were intended to define the toxicity thresholds of PCBs and DDTs in sediments from the Southern California Bight. To achieve that goal, we identified, acquired, and evaluated data from a substantial number of studies that had been conducted within the study area and that were available to us (i.e., through searches of the literature). I understand that the EVS study referred to by Mr. Henderson was conducted for the government; however it was not made available to us. Therefore, we could not use it or refer to it in our report.
 - Mr. Henderson indicated that failure to isolate the impact of DDT and PCBs from that of other contaminants present in the sediments represents a "fatal flaw" of the work. This comment clearly demonstrates Mr. Henderson's lack of understanding of the science and the rationale for deriving the SECs. Our evaluation of the toxic effects of DDTs and PCBs in sediments on the Palos
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Verdes shelf was intentionally designed to determine the toxicity thresholds of these substances when they occurred in complex mixtures with other contaminants in these sediments. In contrast to Mr. Hendersons' assertion, this represents one of the strengths of the study that we conducted.

Collectively, the misinterpretations and misunderstandings of the underlying science render meaningless Mr. Hendersons' comments on the validity and applicability of the various SQGs for DDTs.

6.0 Summary and Conclusions

In summary, it seems like the fundamental disagreement regarding the development of TMDLs for San Diego Creek and Newport Bay is associated with the level of protection that ought to be afforded benthic invertebrates, fish, aquatic-dependent wildlife, and humans that are directly or indirectly (i.e., through the food web) exposed to sediment-associated contaminants. This is a science-policy issue that must be resolved by the SARWQCB and should reflect societal values as a whole (not simply the interests of a single lobby group).

Based on the information that I reviewed, it appears that the SARWQCB has used a reasonable approach to establishing preliminary TMDLs for San Diego Creek and Newport Bay. More specifically, the SARWQCB has suggested using the TELs, on an interim basis (i.e., until the requisite site-specific data become available), as preliminary targets for sediments, with the understanding that the TELs are intended to provide conservative tools for identifying the concentrations of contaminants below which adverse effects on sediment-dwelling organisms are unlikely to be observed. I understand that the SARWQCB intends to replace the TELs with site-specific sediment targets when the requisite data to do so become available. This approach appears to be consistent with the stated objective of establishing TMDLs in the near-term that would provide a high level of protection to beneficial water uses.

The comments provided by Dr. Byard and Mr. Henderson appear to be designed to encourage the SARWQCB to select higher SQGs for DDTs, presumably to result in less restrictive TMDLs. While their interest in having higher TMDLs established for DDTs may be valid, the comments that were offered to the SARWQCB were not. In both cases, the comments provided appear to be based on a limited understanding of the underlying science and data that were used to derive the TELs. In addition, the comments appear to be designed to call into question the credibility of the TELs, the underlying data, and the associated science. When evaluating their comments, it may be helpful to remember that

the TELs and PELs have undergone substantial review, both by the Science Advisory Group and independent peer-reviewers. In addition, the SQGs and the methods with which they were derived have been published in the scientific literature, with the strengths and limitations of these assessment tools clearly stated in the associated technical reports and peer-reviewed journal articles. Furthermore, the TELs and PELs have been adopted by various federal, state, and provincial agencies to support sediment quality assessments conducted within their jurisdictions. Overall, this information confirms that the TELs and PELs provide useful tools for assessing sediment quality conditions.

I hope these brief comments provide some additional insights that support deliberations by the SARWQCB on the TMDLs that are being developed for San Diego Creek and Newport Bay.

Sincerely,

A handwritten signature in black ink, appearing to read 'Don MacDonald', with a large, stylized flourish extending from the end of the signature.

Don MacDonald,
Principal MESL, RPBio, CFP

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The documents below can be downloaded from our web site:
www.waterboards.ca.gov/santaana

ATTACHMENT F TO SEPTEMBER 7, 2007 SUPPLEMENTAL STAFF REPORT

PEER REVIEW LETTERS

UC BERKELEY J. HUNT
UC DAVIS D. ANDERSON
UC WISCONSIN E. CHRISTENSEN

*(Please contact Terri Reeder (951-782-4995; treeder@waterboards.ca.gov) or
Wanda Cross (951-782-4468; wcross@waterboards.ca.gov) if you have any question regarding this
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April 30, 2007

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Dear Ms Cross:

This letter includes my review comments on the Technical Basis of Proposed Basin Plan Amendment for Organochlorine Compounds TMDLs for San Diego Creek and Newport Bay. My expertise includes contaminant partitioning, hydrologic transport processes, sediment dynamics in stream and estuarine systems, source identification from sediment records, and simple fate and transport modeling. My background has relevance to the following categories in Attachment 2: Proposed San Diego Creek/Newport Bay Organochlorine Compounds TMDLs, Scientific Issues:

2. Numeric target derivation
3. Source identification
4. Linkage analysis/loading capability
6. Margin of safety/seasonal variation and critical conditions
7. Implementation and monitoring

Arriving at Total Maximum Daily Loads within evolving watersheds is a complex task that requires considerable judgment and integration across a wide range of scientific disciplines. What is immediately apparent for this proposed action is that the environmental regulatory framework adopted in the United States over the last 40 years is having an effect. California and the United States have recognized that DDT, PCBs, Chlorodane, and Toxaphene were environmentally persistent and toxic to the environment. Their removal from production and use has resulted in declining concentrations in biota, but the time required for improvements are unfortunately measured in tens of years. Given the presence of these compounds and mixtures in the San Diego Creek/Newport Bay watershed at levels anticipated to cause impairment, watershed planning is needed to guide further improvements.

The basin plan amendment wisely recognizes the critical importance of sediments in the partitioning of these organochlorine compounds and in determining the fate of these compounds within the watershed. The very high hydrophobicity of these compounds as quantified by the

octanol water partition coefficient, K_{ow} , predicts that the concentrations dissolved in water will be very small and difficult to measure. Models are therefore needed to address partitioning and bioavailability. Given the importance of compound sorption to sediments, sediment control in the uplands portion of the watershed is needed to minimize sediment erosion and deposition in sensitive downstream habitats. There are also concerns with the release of the sediments through erosion during extreme hydrologic events and eventual deposition within the creek channels, Newport Bay, and perhaps in the coastal waters. I will separate my review into two categories of Critical Concerns followed by Additional Concerns.

Critical Concerns

1. On page 37, the Plan Amendment states that because of the large number of assumptions required to apply Equilibrium Partitioning, a different approach was followed to arrive at numeric targets. Concepts of equilibrium partitioning appear throughout the Plan Amendments with some unanticipated consequences. It thus appears odd to say that equilibrium partition has not been applied.
2. On page 45, Table 4-1 utilizes equilibrium partitioning to relate organochlorine partition coefficients to octanol water partition coefficients. First, in footnote (a) the relationship has an error and should probably be written as $LogK_{oc} = 0.00028 + 0.983LogK_{ow}$ and the contribution of the term 0.00028 is minimal and could be dropped. The ratio of Bioconcentration Factor to the octanol water partition coefficient, BCF/K_{ow} , should be a measure of the lipid fraction in the organism assuming equilibrium partitioning. In calculating that ratio for the organochlorine compounds in Table 4.1, the values range from 0.018 for Chlordane to 0.16 for Toxaphene which suggests data from difference sources and for different organisms are being combined (footnote (k)). For consistency, the same reference organism should be used. The bioconcentration factor from Table 4-1 is critical in the subsequent analysis.
3. The model for calculating existing loads appears in equation (5) on page 62. This model appears simple but has within it many assumptions that might be in conflict. A measured tissue concentration (TC) divided by a literature value of the bioconcentration factor is an estimate of the equilibrium organochlorine concentration dissolved in water. The total suspended concentration is then obtained by dividing by the fraction that is dissolved and this comes from an equilibrium sorption model appearing in equations (9) and (10). Hydrologic variability is then incorporated by picking three different flow tiers and summing up the contributions, although the summation sign is missing from equation (5). As is demonstrated in Figures 2-6 through 2-8, there are substantial differences in tissue concentrations in winter and summer, suggesting either fish migration or rapid exchange of these organochlorine compounds between these organisms and the environment. It is my understanding that compounds with octanol water partition coefficients in the range of these organochlorine compounds are not readily purged from organisms over the seasonal time scale. This appears to be a case where an equilibrium partitioning model is being adopted continuously over the seasons when the system is not at equilibrium. Bioconcentration factors appear in Table 4-1 and are used in Table 4-7 for this estimate of loading, but those numbers were variable due to different organisms. This is inconsistent with the intent of arriving at an annual loading. The model needs greater development, justification and description.
4. The sediment transport modeling greatly benefited from earlier work that utilized the 22

years of US Geological Survey records available on the San Diego Creek. While it is computationally convenient to utilize three flow tiers (low, medium and high) and pick the mean values for those flows, there is no documentation that this analysis preserves sediment loading. Since sediment transport via equation (11) is nearly proportional to flow rate squared, extremely high flow events completely dominate in terms of sediment contribution. Since the actual data are available, how does this three tier model compare to the annual sediment loss calculated from measure daily data?

5. Sediment and organochlorine loading to Newport Bay is dependent upon an accurate representation of organochlorine concentrations on sediments (C_s) and the sediment loading (D_s) as is used in equation (12). The organochlorine concentrations are taken from Bay et al. (2004) according to the Amended Plan, but there is no indication of how many measurements were utilized to arrive at this value. Given the variability of sediment concentration with flow rate and the variability of organochlorine concentration with sediment levels (Figure 5-3), there must be considerable uncertainty in this estimate of existing load. The sediment loading on an annual basis is estimated in Table 4-8, but there may be a discrepancy with the July 1998 US Army Corps of Engineers Feasibility Report. Table 4-8 reports an annual sediment deposition of 31474.17 m³/y for Unit I Basin but in the 1998 USACE report the computed sediment load for the 22 years of record was 354,000 cubic yards for the same Unit I Basin, and this becomes an average annual loading of 12,000 m³, which is considerably different from the value found in Table 4-8.
6. On page 65 of the Amended Plan there is the statement that the average annual sediment load was over 100,000 tons per year and the allowable sediment load for Newport Bay is 62,500 tons. There is no discussion of the uncertainty in either of these numbers and they are each likely to be large. The margin of safety of 10% adopted for TMDLs by the USEPA appears to be low. This TMDL process should reflect the uncertainty in the models and resulting estimates should have some range of values specified to clarify the uncertainty.
7. Hydrologic variability is recognized on page 79, but Figures 7-1 through 7-3 are not reflected in the TMDL analysis. Given the high variability in flow, the high variability in sediment loading, the high variability in organochlorine loading, and the seasonal variability in fish tissue concentrations, the overall analysis does not recognize this or carry along an uncertainty in the estimates. Significant data uncertainties are mentioned on page 81, and there are many ongoing projects that will assist in some of these efforts as summarized in Section 8.2 (page 82), but the level of detail in the summary is not sufficient to indicate if the details of hydrologic variability will be fully represented.
8. As the watershed transitions from range land to agriculture to a mix of commercial, residential and open space, there will be a corresponding change in water quality impacts on the environment. While organochlorine compounds are no longer used or released to the environment, there are many other products available to consumers and landscape professionals that are applied intentionally or non-intentionally on the land surface in commercial and residential areas that may be impacting receiving waters. It would be helpful if the monitoring programs put in place for implementing this Plan Amendment included some anticipatory monitoring. For example I would expect that sediment loads temporarily increase during the transition to commercial and residential land use, and decline following the establishment of more mature vegetated surfaces. Additional loading from crankcase oil, pesticides, fertilizers, animal wastes, and trash might be anticipated and perhaps prevented through a more holistic look at water quality non-

degradation rather than waiting for contaminants to emerge with observable environmental impacts.

Additional Concerns:

1. The Amended Plan could be improved if there was more attention to including only significant digits in numerical values. For example in item #5 above, it was reported that sediment load was 31474.17 m³/y when it would have been just as accurate to write 32,000 m³/yr.
2. On page 51, there is concern expressed that groundwater might be a significant pathway for organochlorine transport based on a January 2006 monitoring report. It is highly unlikely that groundwater will be a significant transport pathway for highly hydrophobic organochlorine compounds, and Table 4.4 indicates there were no organochlorine compound detections. In an era of limited financial resources, it is important to devote those resources to important issues and not get side-tracked with other matters of lesser importance.

Arriving at appropriate TMDLs for complex watersheds is a challenge that can be met through exhaustive data analysis, modeling, and measurements as has been undertaken for the San Diego Creek/Newport Bay. The Amended Plan has made a good start at developing the necessary modeling approaches and data analysis for predicting future conditions and anticipating actions required to meet water quality objects. The appropriate combination of modeling, monitoring, and analysis is a logical means of protecting the water quality for the future. I hope these comments have been helpful in refining that plan.

Sincerely,

James R. Hunt
Lawrence E. Peirano Professor of Environmental Engineering

Peer Reviewer – Daniel Anderson
Received 1/3/07

K. Rose and W. Cross,

As I said I would, I did spend some time (about 8 hours) reading through your document, Total Maximum Daily Loads for Organochlorine Compounds, dated 17 November 2006. First off, and given the diverse and distinguished representation in the original preparation and analyses in this report, along with a diverse and competent group of advisors who met at least three times to discuss various sections of this report in 2006, such a document is highly-likely to be current, scientifically sound, and representative of the most recent risk-assessment approaches to judge, for example, "how much this system can or should be allowed to 'take' from compounds X." And that was my general impression of the report after reading through the document, as I expected. The approach combines physical/chemical characteristics with biological characteristics (ex. BCFs) of the various compounds, and then attempts to tie them together with currently-accepted, recently-developed models (in this case as most recently developed by EPA, the TMDL).

As an ecotoxicologist, I have always been a bit skeptical (from an ecological viewpoint) of the desire by regulatory agencies to assign (realistic) numbers to various physical plus biological phenomena for regulatory purposes, based heavily on sediment or water quality criteria, and general synthetic models. It might, however, be a personal "bias" based on my past experiences with a regulatory agency that emphasized direct and extensive laboratory and field studies with wildlife species (USFWS). But the TMDL approach at least attempts, in my view, to combine, as reasonably as possible, and with a built-in margin of safety (although this potentially introduces an unknown degree of uncertainty), a derivation of some sort of number that regulators and enforcers can work-with. And as ecotoxicologists often state, the unique position of ecotoxicology and its intent is that the "field" be relevant and contributory in our science of risk assessment and then regulation and control of toxic substances, and therefore of high relevance to policy and regulation. It is something we all chide and thus, as any businessman would say: "we had better be able to deliver the goods."

And after-all, we are talking here about pollutants, which do usually act quite as natural organic materials in the way they cycle through ecosystems and individuals, so they can be predicted by and predicated on basic scientific descriptions. But these compounds have been introduced by man's activities and therefore must be controlled and regulated. No, I think the models here, as far as they can go, are scientifically sound and representative of a state-of-the-art approach. And given the fairly large (actually huge) body of toxicological and

physiological and physical data on which to develop these models for San Diego Creek and Newport Bay, a reasonable, scientifically-based regulatory value should be possible, given the fact that it can and will be updated with new insights from the rather large research and remediation programs associated with future and current applications and research in this specific watershed. And given that this is a fairly well-studied watershed (in comparison to many others in California, but not as well-studied perhaps, for example, as San Francisco Bay), I would still expect reasonable and useful TMDL values, especially given the many outstanding follow-up studies that are listed in the report. I wonder if some kind of comparative data (a paragraph or two) on TMDLs from other systems in California would be useful. On reading through the report and thinking about other systems in California, I was curious about this.

One of the most serious criticisms of the "regulatory value" approach is the many intermediate steps between say, sediment or water and then biota, and then between biota, that remain unknown, so that the values are inherently questionable and possibly incomplete. Thus some uncertainty is inevitable. But regulation is still necessary and the approach of "best available data" is thoroughly justified. But, a good monitoring program is necessary (1) to follow trends and changes as regulation and remediation (or continuing downward trends occur (based on your regulatory values as well as the best analytical chemistry), and (2) to further understand the mechanisms and patterns (and further filling-in those boxes in the model of those unknown intermediate steps between sediment and biota), and regarding this specific watershed (my guess is that every watershed is different in some unique way and general models need to be "tweaked" to specific systems and their specific characteristics), to refine understanding through scientific hypothesis-testing and modeling.

That said, I think you are doing that here. It adds a lot of strength to the regulatory process (I am not a lawyer, but something mentioned in your report, a court-case challenge to express scientifically-derived TMDLs on a daily rather than longer-term basis struck me oddly--without more knowledge on this specific example--that well-intentioned and scientific regulatory standards like you have developed here will always be subject to seemingly and often frivolous challenges). Certainly the better the science, the less likely the regulatory values will be challenged.

Given that these TMDLs reviewed here are for "legacy" organochlorines, it is important that the sources be identified as best as possible, but this is difficult, not because of lack of scientific data but because of "legacy regulatory omissions" from the past. I hope that research associated with these TMDLs will be able to "zero-in" a bit better, now that we have more modern regulatory bases and better science to assign regulatory values to ecological phenomena. I assume that the regulatory program has in-it this better data-base on which to

operate for currently-used and more easily source-identifiable compounds which are no-doubt being introduced into the current system. This is mentioned in your report and I assume the TMDLs for things like Se, etc. will be (are being) developed. I would expect TMDLs for these to be even more supportable through more complete data.

It wasn't immediately apparent to me as a reader of the report (but I didn't study it real carefully), but I assume that some of the current studies will be doing PCB-isomer specific, dioxin, co-planar PCBs, etc. analyses in a representative high trophic-level indicator species in the system (preferably in the lower reaches of the system, where maximum bioaccumulation would be expected to occur). The same idea would apply to sophisticated analytical studies that attempt to identify new compounds expected in the system, such as jet fuel components (from the military bases in the watershed) and PDBE-like compounds which are increasingly being shown important in other systems, and expected from this watershed. Some of the more sensitive and sophisticated chemical analyses and determinations should be possible from tissue analyses through the (probably already completed) SCCWRP studies which should be reporting to you at the end of this coming March. I don't know which bird species SCCWRP is studying, but (perhaps too late here but still possible for a future study) a common species in the system rather than, say, endangered or listed species should be used as a continually monitored indicator or sentinel species. In these cases, dynamics, etc. of various compounds are essentially the same in species less likely to be affected and therefore more amenable to detailed study, with more data and samples possible, than the species experiencing potential problems, listed, etc. In that regard, I found the limited data on clapper rails to be minimally (or not even) useful for determinations related to the TMDLs in this report. Use of more common bird species, for example, a bit "lower on the food-web" would seem to be instructive. Pharmacodynamics and effects in these species still operate pretty much on a dose/response basis and are highly predictable (for example, the "gull models" developed by the CWS). Isotope studies can also better place your upper-trophic species (fish or fowl) into a more quantifiable trophic position. Basing regulatory values on only listed-species, again moves you from an ecological, scientific basis to a more policy basis. Don't just consider the listed species in the system. They will yield you the lesser amount of useful regulatory data. Of course, don't ignore them completely either.

I did have a few specific questions that might deserve some further explanation:

1. Could you include a short discussion on why the EPA TMDLs of 2002 were basically redone by the Santa Ana WQCB? What were the differences, briefly, in approach and methodology? Is this a routine or sensitive subject? Just knowing the current situation, I would guess that the state's approach is more

conservative and perhaps more complete and scientific. I just wondered about this as I read through the report.

2. On Table 2-2, I wondered why PCBs and PCB-like compounds were not interpreted through the TEQ approach. Would at least this not warrant some further study with very sophisticated analytical chemistry (say, in a representative series of samples or some representative pools?). I know it is expensive. I see that in Table 2-5, the TEQs for birds and mammals are mentioned. Realizing that the clapper rail samples were the only wildlife values represented, there would be no other data to evaluate for TEQs unless a high trophic, resident fish (page 20) could be evaluated on this basis. What am I missing here? I just have to accept the other values in the same table.
3. On page 24, when "adverse effects were caused by DDT or its metabolites", does this mean the different forms are analyzed and interpreted separately. With DDE, some agencies (I think EPA and some state agencies I have talked-to) have developed eggshell thinning indices as an easily-measurable endpoint for DDE effects, because shell thinning has been so well and extensively studied. This would be quite easy to do with some kind of indicator species (page 26), such as one of the ardeids in the Newport Bay (upper?) system. I just do not know which species nest there, but would guess there is a colony of DCCO or ardeids (such as BCNH or GBHE, that could be sampled, perhaps a tern other than LETE) that could be studied (and sampled).
4. The current field data demonstrate very convincingly that OC residues have and are declining in the system and that levels have become very low, and expectations are that TMDLs will continue to show this (perhaps accelerated by remediation). I wouldn't expect direct toxic effects any more (even eggshell thinning) but perhaps some endocrine disruptions and perhaps biomarker effects that would be physiologically demonstrable but perhaps might not be ecologically relevant, i.e., such minor effects might logically be compensated-for in the biota. Don't know if this is worthy of discussion, however, as it just brings up more unknowns.
5. Regarding the use of sediment residues, sampling them is good because of the known relationships between sediment samples and organisms that seem in most cases better than water samples, but I also wonder if the sediments aren't "sequestering" some of the contaminants in some instances. It would seem that this is an interesting question to pursue and it might relate to declining residues in the biota so adequately demonstrated in this report. I think that "story" is worth a publication, by the way.
6. In the bay, exceedences seem clear enough, as speculated, through bioaccumulation, but it is not clear if they are local in some cases. San Diego

Creek and the drainages of the Tustin Plain seem clearly impeded, and the most conservative ("safest") approach seems to develop TMDLs for anything that exceeds or might be expected to exceed safe levels. The development of informational TMDLs is also a good idea. The more information, the better.

7. I wonder about looking at PDBEs. Perhaps it is already being done.

8. I would say the most important work regarding sensitive wildlife work (birds, amphibians?, reptiles?) is not done. Will the SCCWRP study help out on this question?

9. A minor typo? Page 44, first sentence after "DDT." If you have information that DDT use began in the 1930s, I would be astonished; as it's insecticidal properties were only discovered in 1939 and it was a military secret throughout World War II. I'll bet you mean the 1940s (after the war was over).

10. On page 46, end of second paragraph, several statements seem a bit unclear. First "brown pelican seems to be the most susceptible to adverse biological effects." I don't think this is true. For example, DCCO may be more susceptible or at least equally susceptible. The brown pelican is the most-studied, and therefore the most well-known to have been affected by these legacy pollutants. BRPE is now being reviewed by CA and USFWS for de-listing because of its recovery from DDE. Brown pelicans barely use the study area (the coastal parts) and do not breed there (but fairly close). And the statement of a threshold of 3 ppm ww for eggshell thinning in the BRPE, I am sure comes from studies in the east by Blus and colleagues. The reference given is EPA 2000, but there are two (unlikely) references given, 2000a and 2000b. Given this is not even a major part of the TMDL evaluation, one wonders why it is even (a bit carelessly) mentioned. I do know this literature very well, and it gives me a little "pause" regarding citations I am much less familiar-with. Just a word of caution here not to appear careless! I am on your side.

11. However and overall, this is an impressive document, I think well supported by the science of ecotoxicology, the data, and the data analysis; and then, to even be further documented with the impressive follow-up studies now underway and soon to be in your hands. I have no serious problems with the report, and it promises to get even better with more science coming-in.

Let me know if you have any questions.

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Review of technical basis of proposed Basin Plan amendment for organochlorine compounds TMDLs for San Diego Creek and Newport Bay

Erik R. Christensen

May 2, 2007

Introduction

This is a technical review of the proposed basin plan amendment for organochlorine compound total maximum daily loads (TMDLs) for San Diego Creek and Newport Bay, California. The review task is described in Cross (2006). From the materials made available it appears that the technical staff report (Rose 2006) containing proposed TMDLs along with Attachment to Resolution No. R8-2007-00XX (2006) are the primary documents to be examined with specific reference to TMDLs established by USEPA (2002). Attachment 1 in Cross (2006) is a summary of the proposed Basin Plan amendment, and while it is not specifically mentioned, it appears that Attachment to Resolution No. R8-207-00XX (2006) is the actual amendment referred to. This would be an amendment to Chapter 5 of the Basin Plan which was not sent to this reviewer.

According to Cross (2006), the “overarching” questions that the reviewers are asked to address are (a) whether there are any additional technical issues in the staff technical report (Rose 2006) and the draft Basin Plan Amendment that should be part of the scientific basis of the proposed TMDLs, but are not described, and (b) taken as a whole is the proposed Basin Plan Amendment based on sound scientific knowledge, methods, and practices?

Organochlorine Compounds

The organochlorine compounds considered here, DDT, toxaphene, PCBs, and chlordane have all been banned, and except for PCBs and small amount of DDT in the pesticide Dicofol, they are no longer discharged in the watershed other than by erosion of sediments to which these pollutants may have been adsorbed in the past.

DDT (Dichloro-diphenyl-trichloroethane) was used traditionally to eradicate malaria by killing the mosquito acting as a vector of the disease. Use of DDT for control of disease-causing insects and agricultural pests peaked in the 1960. Because of its adverse environmental effects DDT was banned in 1972 except in special cases. Toxaphene, an insecticide, is a mixture of more than 600 chemicals. It was used extensively in the U.S. until 1982 when it was banned for most uses because of undesirable environmental effects. In 1990 the ban was made complete (USEPA 2002).

Polychlorinated biphenyls (PCBs) were used as synthetic oils in transformers and hydraulic fluids until the mid-1970s when it was banned due to adverse mainly human environmental effects such as liver, thyroid, and dermal changes, reduced birth weight, reproductive toxicity, and cancer (Rose 2006). PCBs can degrade aerobically and anaerobically, for example in aquatic sediments. The ban was in two stages, first it was restricted for use in closed systems, and then there was a complete ban. Chlordane is an insecticide that was used in the U.S. from 1948 to 1988. It was used for control of insects during production of crops such as corn. In 1983 it was restricted for use for subterranean termite control, and then it was phased out completely due to concern for mainly human health effects. It is also moderately toxic to birds and highly toxic to invertebrates and fish (USEPA 2002, Rose 2006).

Development of TMDLs

A total maximum daily load (TMDL) is the maximum amount of a pollutant that may be discharged to a water body while maintaining water quality standards. The loading capacity is the maximum loading that a water body can assimilate and still meet and maintain water quality standards, and the existing loading is the actual mass discharged to the water body per day. The TMDL is usually set as the loading capacity if the existing load is greater than the loading capacity, but as the existing load if this is lower than the loading capacity. For example, for chlordane discharge into Upper Newport Bay, the existing load is 290.7 g/yr and the loading capacity 160.6 g/yr. Thus the TMDL is set at the loading capacity 160.6 g/yr. However, for PCBs the existing load 858.7 g/yr is less than the loading capacity 1528.2 g/yr, and the TMDL is then conservatively set at the existing loading, 858.7 g/yr (USEPA, p. 58, 2002).

The legal basis for TMDLs is Section 303(d) of the Clean Water Act requires states to establish a priority ranking for waters for which effluent limitations are not stringent enough to implement water quality standards, and to establish TMDLs for such waters. EPA will review state submitted TMDLs to determine if they meet all TMDL requirements. If EPA approves the State TMDLs, they will supersede the TMDLs being established now by EPA (USEPA, p. 3, 2002).

The nature of the water quality problem. Even though the concentrations of these organochlorine pollutants are declining in mussels and fish during the last 20-25 years (Figs. 2.2 - 2.4, Rose 2006 and Fig. H-5, H-7a, and Fig. H-8, USEPA 2002), there is a concern that the pollutants can enter the aquatic foodweb and cause adverse ecosystem impact and human health effects. Environmental impacts are evident from Rose (2006) of several of these pollutants using fish tissue screening values established by OEHHHA and the National Academy of Sciences (NAS). For example for DDT in Upper Newport Bay there were several samples during 1995-2004 that exceeded both OEHHHA and NAS standards (Appendix B, Rose 2006).

Note that Food and Drug Administration (FDA) criteria are less stringent than OEHHHA criteria for fish tissue concentrations of total PCBs (Table 2, Appendix B, Rose 2006). For example, FDA's limit for PCBs is 2000 ppb compared with OEHHHA's more stringent limit of 20 ppb. Sediment quality guidelines are given in Table 3 of Appendix B (Rose 2006). Sediment toxicity data are more scattered, but contaminated sediments do show some effect, for example for chlordane in Upper Newport Bay where 27/36 samples exceeded the NOAA ERM of 6 $\mu\text{g/kg dw}$ (Appendix B, Rose 2006. Note: page numbers should have been included in the appendices). Water quality criteria exist (Table 1, Appendix B, Rose 2006) but most measurements show nondetectable concentrations with the methodologies used.

Fish and to a lesser extent sediment concentrations indicate that there is a valid concern for water quality with respect to organochlorine compounds in San Diego Creek and Newport Bay. This is despite the fact that concentrations are declining because of the ban on these compounds.

Numeric targets. The numeric targets for organochlorine compounds for the water bodies are given in Table 6-1a (USEPA 2002) and Table 3.1 (Rose 2006). They are in general agreement except for total PCBs in fish tissue of Newport Bay (30 vs. 20 ppb). The values seem to be reasonably well established except that further rationale should be given for human health vs aquatic life target values (Rose 2006). PCBs should be analyzed by congener and not aroclor since congeners can be very different in their toxicity. Co-planar congeners or dioxin-like PCBs are generally considered to be more toxic.

The calculations of sediment targets through eq. 3, p. 38 (Rose 2006) is reasonable. A better rationale for using NAS guidelines for fish tissue targets is needed. It is not clear how fish tissue targets were calculated. The calculation of targets for human health protection through the 70 yr, 70 kg body weight calculation may be ok provided that consideration is given to declining input concentrations and that dose-response factors need to be well determined (p. 38, Rose 2006).

Some consideration needs to be given to mixture effects in the biological response to many pollutants. For similar compounds toxic units tend to add up, but for different modes of action, there are many possibilities. Generally, mixture effects would lower permissible concentrations and TMDLs. Some further discussion of this issue could be included p. 77, Rose (2006).

Source identification. The outlined source identification distinguishing between point and non-point sources (WLA vs. LA) makes sense. See for example Attachment to Resolution No. R8-2007-00XX Tables NB-OCs-9 and 10. The role of margin of safety (MOS) is understandable. One recommendation is that source identification should rely not only on enumeration or quantification of known sources but also on modeling. For example chemical mass balance (CMB) and factor analysis using for example positive

matrix factorization (PMF) can based on pollutant or congener profiles identify sources and their contributions.

Linkage analysis/loading capacity. The linkage analysis is fairly well described in USEPA (2002) compared to Rose (2006). The diagrams p. F-7 and F-2 are clear although there should be a division sign between fish tissue and BCF in Fig. F-1, and Fig. F-2 reflects an oversimplification of the problem. The case of Newport Bay and to some extent San Diego Creek illustrates the difficulty in using the loading concept in that sediments have a different role in releasing pollutants to the water column depending on sedimentation rate and sediment mixing. Significant mixing in upper sediment layers can release more pollutants to the water column. This issue should be addressed. Also, the pollutant inventory in the Newport Bay sediments should be estimated and compared with annual TMDLs, for example 160 g/yr of DDT input to Upper Newport Bay. I suspect that this and other TMDLs are small compared with the pollutant inventories in the sediments. Thus, even with zero input to the Bay there can be a significant recycling of DDT from bottom sediments which means that it can take a long time before DDT can be delisted. Note, however, that DDT concentrations do decline over the years (Fig. 2-3, Rose 2006). This decline is likely to be influenced both by lower inventories and lower inputs.

USEPA established TMDLs. Values of TMDLs are listed in Tables 6-5 – 6-8 of USEPA (2002). The following compounds have generally larger existing loads than loading capacities (condition 2), and should therefore have reduced inputs: San Diego Creek, chlordane, DDT and toxaphene; Upper Newport Bay, chlordane, and DDT; Lower Newport Bay, DDT. Tables showing allocations, e.g., WLA, LA, and MOS, for all three water bodies and the Rhine Channel are shown pp. 59-60 of USEPA (2002).

SARWQCB proposed TMDLs. Similar values of TMDLs proposed by SARWQCB are listed in Table 6-1a (Rose 2006). In the same order, condition 2 is valid for San Diego Creek, chlordane, DDT, and Toxaphene; Upper Newport Bay, chlordane and DDT; Lower Newport Bay, DDT and chlordane. Load allocations by source type, similar to those in the EPA report are shown in Table 6-2b. The numbers are fairly similar, mostly within a factor 2, for corresponding pollutants, source categories, and water bodies. One significant deviation is for example for chlordane, in Upper Newport Bay from urban runoff. EPA shows 120.5 g/yr and SARWQCB 30.1 g/yr. Another example is total PCBs in Lower Newport Bay which is 409.8 g/yr by EPA and 241 g/yr by SARWQCB. Some further work should be done to seek to clarify or justify these numbers. Clearly, there is significant uncertainty in this evaluation.

Comparison of USEPA and SARWQCB TMDLs. USEPAs and SARWQCB TMDL requirements differ in that SARWQCB only suggest TMDL for informational purposes for Total PCBs and Chlordane for San Diego Creek (Cross 2006), whereas USEPA have established TMDLs in these cases. This is supported by fish tissue concentrations with no wildlife exceedances for total PCB, Reach 1, but only partially for chlordane where there were no data for reach 2. However, Peters Canyon Wash

(tributary to San Diego Creek) show no chlordane exceedances out of 11 fish composite samples 1995-2004 (Rose 2006). The table below illustrates the comparison:

Pollutant	San Diego Creek	Upper Newport Bay	Lower Newport Bay
Total DDT	X	X	X
Total PCBs	*	X	X
Chlordane	*	X	X
Toxaphene	X		

X, Impairment identified by both USEPA and SARWQCB

*No impairment identified by SARWQCB, but informational TMDLs have been prepared

Margin of safety/seasonal variation and critical conditions. The margin of safety is taken as 10% of the total TMDL. This seems to be reasonable. The area has a strong seasonality as evidenced by the annual rainfall pattern, Fig. 7-1 (Rose 2006). Thus much of the sediment input to the estuary comes during episodic events with a few heavy rainfalls. The implication for BMPs and WDRs is that they must be geared towards an accurate description of these events.

Implementation and monitoring. The implementation plan indicated in Tables NB-OCs-13 and 14 makes sense. The phased approach is reasonable. One should be prepared for an adaptive strategy depending on climate. A certain amount of dredging may be necessary in the most contaminated areas. The use of polyacrylamide (PAM) in stabilizing graded areas (p. 107, Rose 2006) and enhance flocculation should probably be limited as the introduction of chemicals in the environment should be avoided if possible.

Discussion

The staff report (Rose 2006) and draft Basin Amendment (Attachment to Resolution No. R8-2007-00XX 2006) constitute a solid and comprehensive response the TMDLs established by USEPA (2002). Most data confirm the EPA loads. However, there are some new data and analysis which indicate that the emphasis on pollutants in certain water bodies should be changed. TMDLs for PCBs and chlordane in San Diego Creek may in fact not be required. The different role of suspended sediment in San Diego Creek and Newport Bay should be realized and used in the linking analysis. Sedimentation rate and sediment mixing can impact the concentrations and biological uptake of pollutants.

As the phased process of TMDL implementation continues, The Santa Ana Regional Water Quality Board should pay attention to the advice from the public following the June 2005 CEQA scoping meeting listed p. 114 in Rose (2006). Some of the points raised were that future meetings should be properly noticed, that there should

be appropriate coordination with other California agencies such as the Department of Fish and Game, and that some facts are encouraging despite the OC contamination, for example that the population of endangered bird species such as the clapper rail population has doubled in a relatively short period.

Summary

- The staff report and draft basin amendment is a solid and comprehensive response to the TMDLs for organochlorines established by EPA.
- Calculation methods for targets for human health protection should be improved to take the declining concentration of organochlorines into account as well as to document the use of appropriate dose-response factors
- The inventory of organochlorines in the sediments of the water bodies should be estimated and compared to proposed TMDLs. If TMDLs are small compared to inventories of pollutants, that would indicate that recycling of pollutants in the ecosystem is an important factor
- The role of sedimentation rates and sediment mixing in making pollutants available to the ecosystem should be clarified by models and observations. Volatilization could also be considered.
- Some further work could be done in reconciling or explaining EPA and SARWQCB determined TMDLs for various sources, pollutants and water bodies.
- An attempt to consider mixture effects may be desirable or necessary since there are a variety of pollutants, not just organochlorines
- PCBs should be analyzed by congener, and consideration should be given to co-planar congeners that are considered more toxic than other congeners
- Source allocation should be done not just by quantifying known sources, but also by receptor modeling using chemical mass balance (CMB) modeling and positive matrix factorization (PMF).

References

Attachment to Resolution No. R8-2007-00XX. 2006. (Draft Basin Plan Amendment).

Cross, W.M. 2006. Letter to peer reviewers. Santa Ana Regional Water Quality Control Board, Santa Ana Region.

Rose, K.L. 2006. Total maximum daily loads for organochlorine compounds. San Diego Creek.: Total DDT and Toxaphene, Upper and Lower Newport Bay: Total DDT, Chlordane, Total PCBs. Santa Ana Regional Water Quality Control Board. Orange County, California.,

U.S. Environmental Protection Agency, Region 9. 2002. Total maximum daily loads for toxic pollutants, San Diego Creek and Newport Bay, California. Alexis Strauss Director Water Division.

The documents below can be downloaded from our web site:
www.waterboards.ca.gov/santaana

ATTACHMENT G TO SEPTEMBER 7, 2007 SUPPLEMENTAL STAFF REPORT

COMMENT LETTERS RECEIVED AFTER DECEMBER 1, 2006 PUBLIC WORKSHOP

BILD
CALTRANS
DEFEND THE BAY
US FISH AND WILDLIFE SERVICE
CITY OF IRVINE
TIC
US NAVY
CITY OF NEWPORT BEACH
LENNAR HOMES
SHEA HOMES
CICWQ
GREAT PARK
COUNTY OF ORANGE
SPON
CITY OF TUSTIN
US ENVIRONMENTAL PROTECTION AGENCY

(Please contact Terri Reeder (951-782-4995; treeder@waterboards.ca.gov) or Wanda Cross (951-782-4468; wcross@waterboards.ca.gov) if you have any question regarding this document.)

The documents below can be downloaded from our web site:
www.waterboards.ca.gov/santaana

ATTACHMENT H TO SEPTEMBER 7, 2007 SUPPLEMENTAL STAFF REPORT
COMMENTS FROM REGIONAL BOARD WORKSHOPS

(Please contact Terri Reeder (951-782-4995; treeder@waterboards.ca.gov) or Wanda Cross (951-782-4468; wcross@waterboards.ca.gov) if you have any question regarding this document.)

The documents below can be downloaded from our web site:
www.waterboards.ca.gov/santaana

ATTACHMENT I TO SEPTEMBER 7, 2007 SUPPLEMENTAL STAFF REPORT

ELECTRONIC MAIL CORRESPONDENCE WITH REGIONAL BOARD STAFF

SCCWRP K. MARUYA
CRG LABS R. GOSSETT
CRG LABS R. GOSSETT
OEHHA R. BRODBERG

*(Please contact Terri Reeder (951-782-4995; treeder@waterboards.ca.gov) or
Wanda Cross (951-782-4468; wcross@waterboards.ca.gov) if you have any question regarding this
document.)*

From: Keith Maruya <keithm@sccwrp.org>
To: Terri Reeder <treeder@waterboards.ca.gov>
Date: 8/7/2007 4:18:06 PM
Subject: Re: Toxaphene analytical methods for sediment and fish tissue

Terri:

I'm out of the office until Aug 13, however, your timing is perfect.

I am still involved with developing an updated method (including using NCI-MS) for toxaphene and toxaphene residues (or breakdown products). I was at a meeting last week with EPA, State of GA and Hercules folks about this.

You are correct in surmising that EPA Method 8081A is not adequate for determining toxaphene residues at your adopted action level (0.1 ppb). This will be a challenge even for the new method under consideration.

The more important thing for CA in my opinion is actually CONFIRMING that there are toxaphene residues in soils/sediment/fish tissue. Since 8081A specifies GC-ECD (and not GC-MS), I would consider reported toxaphene levels to be questionable, especially those in the low ppb range, if in fact that is the method used.

Cost per sample will be higher using NCI-MS, maybe 2 or 3 times higher initially but should come down if/when method is accepted/more widely used. 0.1 ppb (in sediment or fish tissue) will be at the low end of the detection range assuming a 10g sample. I can send you my reprints next week.

Hope that helps for now,
Keith

Terri Reeder wrote:

>Keith -

>

>I left you a voice mail message regarding this topic this morning, but thought that I would follow-up with an e-mail as well. For the Organochlorine Compounds TMDLs, we have gotten a lot of comments from the stakeholders that the sediment targets are too low, in particular for Toxaphene. Our toxaphene TMDL sediment numeric target is 0.1 ppb (dw) and is the same as that used by the NY Dept of Environmental Conservation. Currently, most use EPA Method 8081 and a method detection limit of 10 ppb (dw). After doing some research on the net, I ran across references to several of your publications as well as an interesting document by EPA that is recommending the adoption of alternative analytical procedures (than EPA 8081) that will better identify toxaphene degradation products (please see attached paper). They are recommending the use of GC/NIMS. The problem is, they don't list the specifics of the analytical method or the MDL, which for us is the critical issue. I ran across several alternative analytical methods listed on the astdr web site for determining toxaphene in soils (see attached table), but it is not clear as to whether or not the MDLs for some of the methods would be sufficiently low (Brumley et al. 1993 lists an MDL of 100 ug/kg for their method, but the astdr table does not specify as to whether it is a dry weight or wet weight number, and Onuska et al., 1994 MDL is a wet weight, not dry weight limit).

>

>Do you know if there is presently a analytical method for toxaphene in sediment that could be used to get the low detection limits that we need without costing an arm and a leg (or several other body parts!)?

What can you tell me about the GC/NIMS or other methods? What is the most appropriate method for measuring toxaphene in fish tissue? And lastly, do you have electronic copies of any of the papers listed below that you could forward to me?

>

>I would appreciate any feedback that you could provide me with on this issue!

>

>Thank you!

>

>Terri

>

>Brumley WC, Brownrigg CM, Grange AH. 1993. Determination of toxaphene in soil by electron-capture negative-ion mass-spectrometry after fractionation by high-performance gel-permeation chromatography. *J Chromatogr* 633: 177-183.

>

>Fingerling G.1998. Investigations on degradation of toxaphene in contaminated soils and characterization of the major products. *Fresenius Environ Bull.* 7:532*536.

>

>Krock B, Vetter W, and Luckas B.1997. PCB/toxaphene group separation on silica prior to congener specific determination of compounds of technical toxaphene in fish and other samples by gas chromatography/electron capture detection. *Chemosphere.* 35:1519*1530.

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>Maruya KA, and Francendese L.1999. Analysis of toxaphene residues in sediment and mummichogs (*Fundulus* sp.) from Terry/Dupree Creek. Final Report*Phase II. U.S. Environmental Protection Agency, Atlanta, GA.

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>Maruya KA, Vetter W, Wakeham SG, Lee RF, and Francendese L.2000. Selective persistence and bioaccumulation of toxaphene in a coastal wetland. In Lipnick RL, Hermens JLM, Jones KC, Muir DCG, eds, *Persistent, Bioaccumulative and Toxic Chemicals: Fate and Exposure.* ACS Symposium Series 772. American Chemical Society, Washington, DC.

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>Maruya KA, Wakeham SG, and Francendese L.1998. Analysis of toxaphene residues in sediment and mummichogs (*Fundulus* sp.) from Terry/Dupree Creek. Final Report*Phase I. U.S. Environmental Protection Agency, Atlanta, GA.

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>Onuska FL, Terry KA. 1989. Quantitative high-resolution gas chromatography and mass spectrometry of toxaphene residues in fish samples. *J Chromatogr* 47 1: 16 1 - 17 1 .

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>Onuska FL,Terry KA, Seech A, et al. 1994. Determination of toxaphene in soil by electron-capture negative-ion mass spectrometry and capillary column gas chromatography. *J Chromatogr A*665: 125-132.

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>Saleh MA.1991. Toxaphene: Chemistry, biochemistry, toxicity and environmental fate. *Rev Environ Contam Toxicol.* 118:1*85.

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>Vetter W, and Scherer G.1998. Variety, structures, GC properties, and persistence of compounds of technical toxaphene (CTTs). *Chemosphere.* 37:2525*2543.

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>Zhu J, Mulvihill MJ, and Norstrom RJ.1994. Characterization of technical toxaphene using combined high-performance liquid chromatography*gas chromatography*electron capture negative ion mass spectrometry techniques. *J Chromatogr.* 669:103*117.

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>

>

>Terri S. Reeder, PG, CEG, CHG

>Associate Engineering Geologist

>Basin Planning - Coastal Waters

>Santa Ana Regional Water Quality Control Board

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>
>

From: "Rich Gossett" <crglabs@sbcglobal.net>
To: <treeder@waterboards.ca.gov>
Date: 8/9/2007 3:18:49 PM
Subject: FW: Toxaphene

Terri,

Just received your voice message and I have provided the information you requested below.

We are using EPA method 8270 for our Toxaphene analyses and the cost is \$200 per sample. This is not a very sensitive technique for 2 reasons. First, toxaphene is a mixture of several hundred compounds but my standard is based on a mixture of all of them so the mass of each component is not known but one can assume it to be a nominal 1/200 the solution concentration for each peak. Second, toxaphene fragments so easily that I lose a lot of the signal when it breaks up into so many fragments.

My other option is Negative Ion Chemical Ionization (NCI or NICI) which is equivalent to using an electron capture detector but better. The use of chemical ionization is allowed as part of EPA method 8270. In this case we inject methane into the system and "softly" ionize the toxaphene molecules instead of breaking them up into many fragments. Then we can set the GCMS to measure the negative ions which does 2 additional things for you. First, generally only molecules with halogens like Chlorine or bromine are detected so we obtain a much cleaner signal. And second, a cleaner signal means less background noise which means lower detection.

I can easily meet your 0.1 ng/dry g requirement for tissues and sediments using NCI/GCMS.

The cost is \$250 per sample and includes all qaqc such as blanks, dups, MS, and MSD.

I hope this information helps,

Rich

Laboratory Director


CRG Marine Laboratories, Inc.

310-533-5190 ext. 130

Mail Message

N

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From: "Rich Gossett" <crglabs@sbcglobal.net>
To: Terri Reeder
Date: Wednesday - August 22, 2007 2:41 PM
Subject: RE: Analytical limits and CTR criteria for OC pollutants in water
 Mime.822 (3978 bytes) [\[Save As\]](#)

Terri,

We can do the Chlordane, DDT and PCBs with our standard technique. The caveat is how you treat values that are based on the sum of more than one component which in this case is all of them. For example, there are six metabolites for Total DDT (2,4'-DDE, 4,4'-DDE, 2,4'-DDD, 4,4'-DDD, 2,4'-DDT, and 4,4'-DDT). I can detect each individual metabolite down to about 1 ng/L which is at the chronic value of 1. But for Total DDT (there is no criteria value in the table for this) you are adding all 6 together so do you keep the MDL at 1 or do you add them all together and call it 6ng/L. My opinion in this context is that you should use 1 but not everyone agrees with me. Chlordane is based on 5 components and PCBs are based on 51 components detectable down to 1 for each one.

TOxaphene is the harder one because it is listed at 0.2 ng/L for the toxaphene mixture of numerous components which means I need an mdl of 0.01 ng/L (roughly) to get there. The only way I can do that is with NCI GCMS but it is doable.

Regards,
Rich

-----Original Message-----

From: Terri Reeder [mailto:treeder@waterboards.ca.gov]
Sent: Wednesday, August 22, 2007 1:34 PM
To: crglabs@sbcglobal.net
Subject: Re: Analytical limits and CTR criteria for OC pollutants in water

Rich -

Are there analytical methods that can detect the following list of compounds at their CTR criteria concentrations (see attached document) in both fresh and salt water - especially the chronic criteria?

Total DDT
Total Chlordane
Total PCBs
Total Toxaphene

Thanks!

Terri

Terri S. Reeder, PG, CEG, CHG
Associate Engineering Geologist
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Email from Bob Brodberg
11/14/06

Hi Kathy,

Sorry to respond slowly, we have a number of priority projects and not enough resources for them. So what else is new?

Anyway, I don't really understand how the 1999 Screening Values attained their current role as part of the 303(d) listing protocol. I was not directly involved in the State Board process. People tell me I sometimes get quoted (or misquoted) about listing questions. I think Craig Wilson asked me in the elevator if I would use data older than 10 years for listing. I think I said that I would not use organics data much older than this, but this may "criterion" have been applied to metals as well. Based on mercury in fish I don't think there have been long term changes in metals concentrations, but there have been in organics. I suspect the OEHHHA SVs were "adopted/noted" in the policy because they were the most clear and recent "bright lines" available. As such they are limited but OK. It causes us a certain amount of heart-burn when agencies use values that we created for some purpose for other purposes, because they may not understand the intent, or may misstate the original purpose. My feeling is that if agencies use these as SVs it is their responsibility to examine, accept and explain the underlying assumptions and limitations and link them with how they intend to use the OEHHHA SVs. In general I look at SVs as a starting point and consequently don't think that they translate directly into a TMDL target. They are not our advisory level end points, so I would recommend that anyone else use them as endpoints without careful local examination and justification. If you do this you may come up with other values anyway.

I hope that helps.
Bob

>>> "Kathy Rose" <krrose@waterboards.ca.gov> 10/18/2006 10:11 AM >>>

Hi Bob -

Can I trouble you for a little more feedback on the State's use of SVs? It appears to me that you have been knowledgeable of the State's use of the OEHHHA SVs for purposes of impairment assessments (the State's Listing Policy) as well as for purposes of setting TMDL targets (note that neither of these applications involves using OEHHHA SVs as water quality standards). At the first TAC meeting, I believe you indicated that until the draft guidelines are finalized that it was reasonable to continue on using the old SVs. What is your opinion on the State's use of these numbers in establishing impairment and as TMDL tissue targets? Do you think it is reasonable to use them for these purposes, as long as the underlying limitations and assumptions are explained and acceptable? If site-specific human health targets were being developed for TMDLs, do you think it is reasonable to use the OEHHHA SVs as an interim target or do you think another approach would be better? I'd appreciate any feedback you can offer. Thanks!

Kathy L. Rose, Ph.D.
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